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PERSPECTIVES ON THE ECOLOGY OF CRIME:

AN APPLICATION AND APPRAISAL

by



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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF ARTS

DEPARTMENT OF SOCIOLOGY

EDMONTON, ALBERTA

SPRING, 1971

THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Perspectives on the Ecology of Crime: An Application and Appraisal" submitted by Peter Engstad in partial fulfillment of the requirements for the degree of Master of Arts.

ABSTRACT

The research pertaining to the ecology of crime can be grouped into three categories on the basis of the techniques employed in measuring the distribution of offenses. These categories have been referred to as the "Chicago School" and its derivatives, "Environmental Opportunities for Crime," and the "Deployment of Police Manpower." The focus of this thesis has been on the formulation, application, and evaluation of measures of criminality associated with each of the above categories of analysis.

Researchers identified with the "Chicago School" have characteristically employed population-based rates in measuring the distribution of offenses. In respect to this approach, the current study examines what happens when different risk populations are used as a basis for rate calculations. For example, conventional population-based measures for the city centre incorporate the number of residents as an estimate of the risk population for offenses therein. By adding the number of transients, shoppers, and others frequenting the downtown area to this estimate, it was possible to demonstrate the inflationary bias of conventional measures.

The studies of the distribution of offenses relative to the distribution of environmental opportunities for their commission suggest that opportunities for specific crimes are relevant in explaining the distribution of these offenses. In this regard, it was demonstrated that distinctive patterns of criminality were associated with the presence of

licensed hotels and shopping centres in selected areas. Auto theft and crimes such as assault, disorderly conduct, and violations of the Liquor Act were more frequent in areas with hotels than in adjacent areas without hotels. Crimes such as theft, auto theft, and mischief tended to cluster in areas with shopping centres. To compare the extent to which similar opportunities are exploited in different areas of the city, a series of "Opportunity Indices" were calculated. Examples would be the "Auto Index" which is a ratio of the number of auto thefts over the number of parking stalls, and the "Bar Index" which is a ratio of the number of offenses such as assault and disorderly conduct over the number of bar seats in the respective facilities.

Finally, others contend that the distribution of offenses known to the police tells more about the agency generating the statistics than it does about the actual distribution of criminality. In response to this assertion, procedures were outlined whereby one could measure the extent to which the deployment of police manpower affects the distribution of less serious offenses.

This study reflects a modest contribution to the methodology associated with each of the three major perspectives on the ecology of crime. New dimensions of analysis have been opened, and several new measures have been added to the repertoire of techniques amenable to ecological analysis. It is hoped that the results and implications for further study arising out of this thesis will stimulate successive refinements, both in measurement and in explanation.

ACKNOWLEDGMENTS

Thank you, Dr. Hackler, and members of my committee for your interest, assistance, and patience. Your contributions and encouragement are gratefully acknowledged.

Special thanks are also due Inspector S. Stevens of the Edmonton City Police Department who generously allowed access to offense data and the Resource Allocation Study done by his department. The cooperation of the City Assessor's Office and the City Planning Department has also been most helpful.

In addition, I would like to thank Ilse Hobin for her help with the maps, and Anita Stroud for her help with computer programs.

My wife, Sonia, has endured nights at home alone, weekends and holidays when we never left the apartment, my growling on 'bad days,' and a host of other trials. Thank you seems rather trivial, but you know what I mean.

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CHAPTER I

INTRODUCTION

In his Presidential Address to the Pacific Sociological Association, Donald R. Cressey, a noted criminologist, contends that a theory explaining social behavior should have two distinct but consistent aspects:

First, there must be a statement that explains the statistical distribution of the behavior in time and space (epidemiology), and from which predictive statements about unknown statistical distributions can be derived. Second, there must be a statement that identifies, at least by implication, the process by which individuals come to exhibit the behavior in question, and from which can be derived predictive statements about the behavior of individuals (Cressey, 1960: 47).

This thesis is addressed to the first of these two points.

If there is need of explaining the distribution of crime in space and time, there is a prior need of ascertaining what that distribution looks like. Analyzing the distribution of phenomena in space and time is typically assumed under the rubric "ecological analysis." In criminology such analyses involve calculating measures of criminality and analyzing their distributions.

In the extensive criminological literature there is evidence that different measures of criminality yield different distributions of the phenomena. In turn, different explanations have been adduced to account for the different distributions. Thus, how crime is measured has implications for how it is to be explained, and conversely, how one explains the distribution of crime has implications for how it is to be measured.

The variety of explanations for the distribution of crime can be grouped into three categories on the basis of the measures by which the statistical distributions to be explained have been generated. First, there is what has come to be known as the 'Chicago School' and its derivatives (Park, 1925; Shaw and McKay, 1951; and others). Researchers in this category typically employ population based offense rates in analyzing the distribution of offenses. In turn, the demographic and social characteristics of the population are used to explain the distribution so derived.

The second category of research involves analyzing the distribution of offenses in relation to the distribution of environmental opportunities for crime (Boggs, 1965). Structures such as stores, bars, and parking lots might be considered conducive to the occurrence of acts of shoplifting, assault or drunkenness, and auto theft, respectively. Opportunities for crime are thus elevated to the status of explanatory variables.

Finally, the distribution of crime can be analyzed on the basis of how the police, as the major instrument of social control, deploy their forces (Chambliss and Nagasawa, 1969; Piliavin and Briar, 1964). The statistical distribution of less serious offenses is held to be a product of the distribution of police manpower.

These categories of ecological analysis are considered in Chapters II, III, and IV respectively. Within each of the three categories of analysis, the focus of this thesis is on the formulation, application, and evaluation of measures of criminality. In Chapter II, for example, an attempt has been made to improve the estimate of the risk population

used in rate calculations for the city centre. In Chapter III, the distribution of specific offenses relative to environmental opportunities for their commission has been examined. In Chapter IV, several procedures whereby one could measure the extent to which regional variation in the deployment of police personnel influences the distribution of less serious offenses have been outlined.

In response to Cressey's mandate cited above, it is hoped that an improved accounting of the distribution of criminality in time and space will serve to generate more accurate prediction and thereby more powerful theory. Increasing what is 'known' about the distribution of crime provides the foundation for increasingly precise testing of both existing and emergent propositions in respect to the ecology of crime.

CHAPTER II

THE "CHICAGO SCHOOL" AND ITS DERIVATIVES

Ecological analysis was a favorite analytic tool of the "Chicago School" of criminologists whose work contributed such concepts as 'crime area' and 'delinquency area' (Park, et al, 1925; Shaw and McKay, 1951; among others). A prominent characteristic of research in this category was the use of population based crime rates in the identification of areas of high criminality. Shaw and McKay, for example, computed delinquency rates for areas of Chicago using the number of resident delinquents in the numerator and the male population aged 10-16 in the denominator.

Typically, these researchers found that delinquency rates systematically declined as one approached the periphery of the city. The concentration of offenders living in the centre of the city was attributed to the social and demographic characteristics of the core area. Competing normative structures, low educational and occupational opportunities, social disorganization, low income, low social status and the presence of multiple family dwellings (high population density) were among the factors held responsible for the criminal propensity of core area residents.

It was also found that the concentration of criminality in the heart of the city persisted over time. Notions of "cultural diffusion" (Park, et al, 1925) and "cultural transmission" (Shaw and McKay, 1942) were adduced in an attempt to explain this finding. Shaw and McKay, for example, suggested that youth in these areas had contact with delinquent

contemporaries and also with older offenders who in turn had contact with delinquents preceding them. They concluded thereby that traditions of delinquency were transmitted down through successive generations of boys, in much the same way that other aspects of culture are transmitted.

A number of later studies, including Schmid (1960a and 1960b), Lander (1954), Bordua (1958-59), and Chilton (1964) among others, contributed additional insight into the ecology of crime. Schmid examined the ecology of crime both in reference to where offenders lived and in respect to where offenses occurred. Offender rates were represented as a ratio of arrestees per 100,000 population in census tracts. Offense rates considered the number of serious crimes known to the police per 100,000 population. He concluded that urban crime areas, including areas where criminals reside and areas where crimes are committed, are generally characterized by the following factors: low social cohesion, physical deterioration, high population mobility, low socioeconomic status and weak family life. For specific crimes such as shoplifting, the concentration of offenses in the centre of the city was attributed to the concentration of retail outlets, the crowds, and the anonymity of the area.

The finding that the occurrence of specific crimes was geographically related to structural opportunities for their commission was noted much earlier by White (1932) and Lottier (1938). Both found that offense rates for serious crimes tended to rise slightly near the periphery of the city. This was accounted for, at least for crimes against property, by the presence of satellite business districts in the city suburbs.

If one accepts the contention that population-based offense rates are useful in the identification of areas of high criminality, then one

must either implicitly or explicitly accept the following assumptions. First of all, the use of population figures in the denominator assumes a high degree of coincidence between the areas where offenses occur and the areas where offenders reside. Accordingly, the larger the area under study, the less critical this assumption becomes. It is nonetheless regrettable that data pertaining to the residence of offenders is not available to examine this assumption. The literature (Schmid, 1960b: 660; Boggs, 1965: 903) sustains this assumption in regard to offenses such as vagrancy, liquor offenses, aggravated assault, and others reflecting personal disorganization. The empirical support is less conclusive for crimes such as auto theft, burglary, and negligent driving.

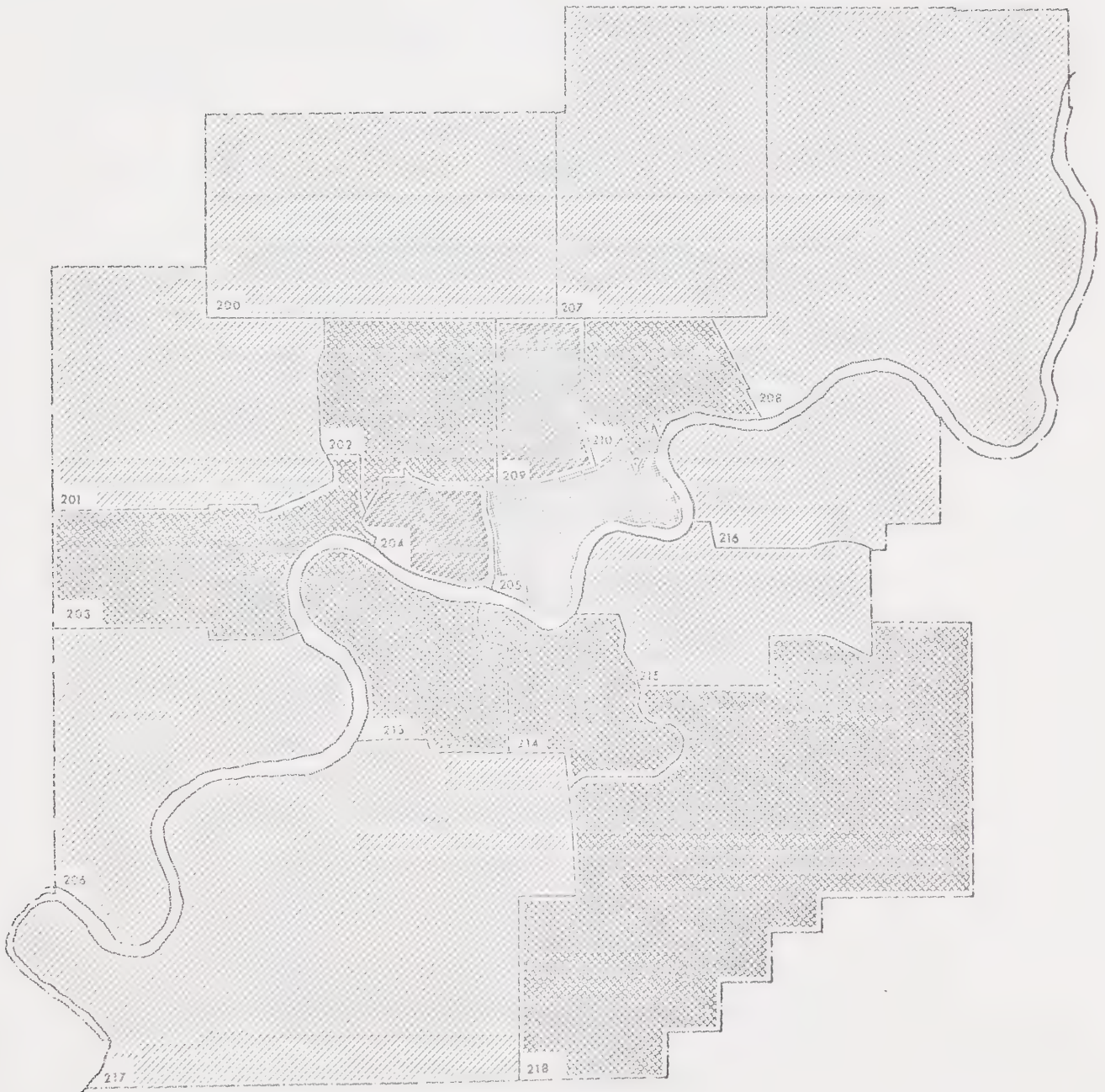
Moreover, when using population based rates in the identification of 'crime areas' it is important that the population base be as accurate an estimate of the risk population as possible.

There are two interrelated factors which affect the adequacy of using the resident population in the denominator of rate calculations. These are errors in population enumeration and time of day. The problem of errors in census enumeration is particularly acute in reference to the core of the city. There is some support for the notion that even recent enumerations may bias the distribution of population based crime rates. In the city centre, enumerators often fail to record a relatively large population of transients and, because of the characteristically unstable home conditions, a large number of residents as well (Taeuber, 1968: 36). Also, 'time' is an important variable in rate calculations for the city centre. The number of persons in the downtown area varies by time of day. Traditional rate calculations obscure, in particular, the effect of large numbers of people entering the central city during business hours.

Schmid (1960a: 676) and Boggs (1965: 901) both note that persons entering the central business district to shop or whatever are potential contributors to crime in this area. Neither of them, however, was able to include these potential offenders in the risk population on which business district rates were calculated.

In both the above cases, the underestimate of the risk population would inflate the offense rate for the city centre. The problem, then, is one of correcting these recurring errors in rate calculation and thereby to measure the inflationary bias of traditional rate calculations for the downtown area (see Figure 1). To provide insight into this problem, data pertaining to offenses known to the police (Edmonton, 1968) were used to calculate conventional population-based offense rates. (Please refer to Appendix I for a discussion of processing and format of the offense data used in this and succeeding phases of analysis). Figure 1 shows the distribution of population-based offense rates for Part I (serious) crimes occurring between 8:00 A.M. and 4:00 P.M.. The boundaries of Area 205 approximate the boundaries of Edmonton's central business district. It is argued that the resident population is an underestimate of the risk population for offenses occurring between 8:00 A.M. and 4:00 P.M., and that the rate pictured for the city centre is spuriously high. The number of transients, shoppers, employees, and others in the city centre would have to be included in the risk population before an accurate offense rate for the city centre can be calculated.

Figure 1
 OFFENSE RATES FOR PART 1 CRIMES
 OCCURRING BETWEEN 8 A.M. AND 4 P.M.
 POLICE PATROL DISTRICTS, EDMONTON: 1968



LEGEND

NUMBER OF OFFENSES PER
 1000 TOTAL POPULATION

	0-9		16-20
	10-15		21 AND OVER

Table 1 shows the crude offense rates, both for Part I (serious) crimes and thefts, for each patrol district in the city of Edmonton. On each of these measures the areas are ranked from 1-17; 1 being the area with the lowest offense rate and 17 being the area with the highest rate.

Table 1

Crude Offense Rates per 1000 Population
For the Period 8 A.M. to 4 P.M. in all
Patrol Districts. Edmonton, 1968.

Patrol District	Part I Crime (serious)		Thefts	
	Rate	Rank	Rate	Rank
200	5.6	2	3.8	2
201	9.9	8	6.3	9
202	12.0	13	7.9	13
203	10.3	9	6.2	8
204	20.2	16	12.8	16
City Centre				
205	57.0	17	37.0	17
206	7.4	4	4.5	5
207	8.0	6	5.5	7
208	7.1	3	4.4	3
209	16.6	15	10.7	15
210	13.6	14	7.9	13
213	10.4	10	6.6	10
214	11.9	12	7.3	11
215	7.6	5	4.4	4
216	8.7	7	5.2	6
217	5.4	1	3.8	1
218	11.7	11	8.0	14

Looking first at the crude offense rates for Part I crimes, Table 1 shows that the city centre (Area 205) has the highest rate in the city with 57 cases per 1000 population. Peripheral Area 217, with 5.4 offenses per 1000 population ranks as the least criminal in the city.

When patrol districts are ranked on the basis of thefts alone, a similar pattern prevails. The city centre is again the highest with 37 offenses per 1000 population. Suburban Area 217 with 3.8 offenses per 1000 population again has the lowest offense rate.

THE 'CORRECTED' ESTIMATE OF THE RISK POPULATION IN THE CITY CENTRE (AREA 205)

To correct for errors in enumeration in the city centre the average number of persons resident in downtown transient hostels was added to the population base ($n=600$, City and Provincial Welfare Depts., 1968). Since transient hostels are enumerated during a census, the figure cited above is actually a crude estimate of the increase in hostel residents since the last census (1966) plus the number of transients who escaped enumeration. Also, persons staying overnight in downtown hotels form part of the risk population. A conservative estimate of their presence in the downtown area between 8:00 A.M. and 4:00 P.M. was arrived at by counting one person for each of 50% of the available rooms ($n=1018$, City of Edmonton Planning Dept.). The adequacy of this estimate can be challenged but the fact that hotel residents are potential contributors to downtown criminality seems inescapable.

The City of Edmonton Cordon Count (Vehicles 1967, Transit Passengers, 1968) provided a measure of the number of persons entering the downtown area to work, shop, or whatever. The total accumulation of vehicle passengers between 8:00 A.M. and 4:00 P.M. was 24,000. During the same period, 30,431 persons entered the downtown area by bus. No measure of the inflow of pedestrians was available. In any event, the inflow of pedestrians would probably be cancelled out by the exodus of those persons who live in the city centre but work elsewhere in the city.

Thus the denominator in the 'corrected' downtown rate calculations includes:

12,832	residents
600	transients
1,018	hotel residents
24,000	accum. vehicle passengers
<u>30,431</u>	accum. transit passengers

for a total of 68,881 persons.

While the 'corrected' population base is still an imprecise estimate of the downtown population during business hours, it is a considerable improvement over the resident population alone.

Both crude and 'corrected' offense rates for the city centre appear in Table 2. The crude offense rates are a repetition of the data found in Table 1; 12,832 residents figured in the denominator of these rate calculations. The 'corrected' offense rates are based on an 'N' of 68,881 which includes the 12,832 residents of the city centre plus the number of persons entering the downtown area between 8:00 A.M. and 4:00 P.M. as noted above.

Table 2

Crude and 'Corrected' Offense Rates
For the City Centre (Area 205) and
Patrol District Average.
Edmonton, 1968

City Centre	Part I Crimes		Thefts	
	Rate/ 1000 pop.	Patrol Dist. Avg.	Rate/ 1000 pop.	Patrol Dist. Avg.
Crude Rate	57	13.1	37	7.85
Corrected Rate	10.6	10.4	7	6.13

Looking at Table 2 and comparing the crude and 'corrected' rates for the city centre, the inflationary bias of conventional rate calculations is quite apparent. By making the 'corrected' denominator a more sensitive estimate of the risk population, the rate for Part I crimes changed from 57 to 10.6 cases per 1000 population. For thefts the rate changed from 37 to 7 cases per 1000 population.

Conventional rate calculations showed the city centre to be vastly more criminal than other areas. The city centre has a crude rate for Part I offenses of 57 cases per 1000 population compared with an average of 13.1 for all patrol districts. In respect to thefts, the city centre has 37 offenses per 1000 population compared to an average of 7.85 cases in all patrol districts.

Comparing the 'corrected' city centre rates with rates in areas which have not been similarly corrected may be somewhat misleading. For example, some suburban residential areas may lose population between the hours of 8:00 A.M. and 4:00 P.M. with the exodus of persons working in other areas. In suburban areas with concentrations of business there may be an increase in the risk population similar (though smaller) to that documented in respect to the city centre.

Nevertheless, given the massive concentration of business in the downtown area as compared with the much smaller concentrations in outlying areas, it seems reasonable to assert that the population increase in the city centre is greater than that in suburban areas. Hence, even though comparing the 'corrected' city centre offense rate with uncorrected rates for other areas is somewhat inaccurate, it may illustrate the effect of correcting the population base in rate calculations.

On both 'corrected' measures the city centre ranks only slightly above the average for all patrol districts; 10.6 Part I crimes per 1000 population in the city centre is only slightly more than the patrol district average of 10.4. Similarly, the 'corrected' theft rate of 7 offenses per 1000 population is only slightly larger than the patrol district average of 6.13 offenses.

In spite of the lack of comparability between rates, it also seems reasonable to assert that the 'corrected' rate reduces the disparity between the city centre and suburban areas covering the same time interval. For Part I crimes the corrected downtown rate of 10.6 offenses per 1000 population depicted in Table 2 is about the same as the rates in peripheral patrol districts 201, 203, and 218 described in Table 1. These suburban areas have 9.9, 10.3, and 11.7 offenses per 1000 population, respectively. A similar pattern prevails in respect to thefts.

Summary: The Relationship between Crude and Corrected
Offense Rates for the City Centre

The preceding analysis assumes that the population in an area is a valid basis for identifying regional variations in the distribution of offenses. Subject to the validity of this assumption (the focus of Chapter III), it is felt that the 'corrected' rates presented in the foregoing analysis are a more accurate representation of crime in the central business district than has been evidenced in the literature to date.

THE RELATIONSHIP BETWEEN THE DISTRIBUTION OF OFFENSES
AND REGIONAL VARIATIONS IN THE AGE, SEX, AND MARITAL
STATUS COMPOSITION OF THE POPULATION

Using the total population as a base for rate calculations involves

the further assumption that the residents in an area contribute equally to offenses known to the police, regardless of age, sex, marital status, or population mobility within the geographic units of analysis. This is not a serious assumption if one is only interested in a gross picture of the distribution of offenses. If, on the other hand, one is attempting to explain rather than merely describe the distribution of offenses, the possible influence of the distribution of the foregoing demographic characteristics cannot be so easily dismissed.

"Categoric risk" is a term which refers to variations in the likelihood or chances that certain groups or categories of individuals will be arrested (Reckless, 1967: 98). In other words, the risk of being identified as a criminal is greater for some categories of individuals than for others.

There is evidence that on an individual basis the categoric risk or risk of involvement in crime is greatest for young single males (Reckless, 1967: 98-105). In respect to mobility, one could argue as follows. The population of highly mobile tracts may change many times. Thus the enumerated population on which rates are computed is an underestimate of the total risk population (it does not account for replacement) and thereby inflates the rates for these areas.

The preceding discussion suggests that the distribution of offenses is related to the demographic profile of the community. On this basis it would be reasonable to expect areas ranked high in criminality on the basis of the percentage of total Part I crimes in the areas to also rank high according to the following criteria:

- a) Age --percent of total population between 15 and 54,
- b) Sex --percent of total males between 15 and 54, and

- c) Marital
Status --percent of total single males between 15 and 54.

Conversely, areas ranked low in criminality would be expected to rank low on the preceding criteria.

Since the demographic measures pertaining to age, sex, and marital status are increasingly sensitive measures of categoric risk in the population, one would expect successively higher rank order correlations with the distribution of offenses. These data are illustrated in Table 3. No analysis was undertaken in respect to population mobility. The most recent data on mobility appear in the 1961 census. In the meantime, Edmonton has experienced phenomenal growth and it was felt that the data simply would not suffice.

In Table 3 the patrol districts are ranked according to the amount of crime and the size of the risk populations in each. In the first column, for example, Area 206 has the fewest crimes and has a rank of 1. Patrol district 205 (the downtown district) has the most crime and is thus ranked 17. In Column Two, the patrol districts are ranked according to the size of the population residing in each. Patrol district 200, ranked 17, has the most people while Area 213, ranked 1, has the fewest. The rankings in each of the other columns was obtained in the same way. The population data corresponding to Patrol districts 202 and 204 are grossly inaccurate. This is a result of transferring the population data from census tracts to patrol districts. In the cases mentioned above, the boundaries were very different and the reader is advised against making any inferences on the basis of the population data in these two cases.

Table 3

Patrol Districts Ranked* by Amount of
Part I Crime and Size of Increasingly
Sensitive Risk Populations in Each.
Edmonton: 1968

Patrol District	Risk Population				
	Crime	Total	Ages 15-54	Males 15-54	Single Males 15-54
200	10	17	15	17	15
201	13	11	11	11	10
202	14	3	3	3	4
203	10	14	14	12	12
204	12	2	2	2	2
205	17	7	7	6	16
206	1	5	5	4	3
207	16	13	13	14	11
208	15	16	16	16	14
209	10	7	8	7	13
210	8	6	6	5	7
213	2	1	1	1	1
214	7	4	4	10	6
215	5	10	10	9	9
216	3	9	9	8	5
217	6	15	17	15	17
218	4	12	12	13	8

* 1=Fewest
17=Most

Looking at Table 3, the city centre (Area 205) ranks highest in terms of criminality. It ranks seventh in respect to total population and persons aged 15-54 living in the area, sixth in terms of males 15-54 in the area and sixteenth (second highest) in terms of single males 15-54 in the area. In other words, the city centre ranks fairly low in terms of the percent of the total population residing therein, but ranks high in respect to the percent of single males aged 15-54, the most sensitive

measure of the categoric risk of the resident population. This conforms to the assumption that areas high in criminality should also rank high in respect to the categoric risk of residents therein. At the other extreme, Area 213 which is low in criminality (ranked 2) is also low in regard to the categoric risk of residents in the area. It has the lowest rank on each of the increasingly sensitive measures of categoric risk.

Rank order correlations were calculated on the basis of the rankings in Table 3 in order to see if the increasingly sensitive measures of categoric risk would yield increasingly high rank order correlations with the distribution of offenses across all patrol districts. The results of this analysis are depicted in Table 4.

Table 4

Rank Order Correlations* Between the Amount
Of Part I Crime and Increasingly Sensitive
Risk Population, for all Patrol Districts.
Edmonton: 1968

	Risk Populations			
	Total	Ages 15-54	Males 15-54	Single Males 15-54
Amount of Part I Crime	.18	.20	.21	.46

*Spearman's rho.

Looking at Table 4, the rho obtained in correlating crime and total population, the least sensitive measure of categoric risk, was low (.18). For crime and population 15-54 the rank order correlation was higher (.20); for crime and males 15-54 the rho was higher still (.21); and for crime and single males 15-54, the most sensitive measure of categoric risk, the rho was still higher (.46). Changed to a 'Z' score, a rho

of .46 is found to be significant at the .03 level (1 tail test).

Thus the findings tend to support the argument that the distribution of offenses is related to the distribution of the age, sex, and marital status of residents across the same areas. Increasingly sensitive measures of the risk population produced increasingly high rank order correlations with the measure of crime occurrence.

Summary: The Relationship between the Distribution of Offenses
And the Characteristics of the Risk Population

Having attained the foregoing results, the problem becomes one of assessing the explanatory power of the demographic variables.

It is felt that the findings are a valid representation of the relationship between the distribution of offenses and the categoric risk of residents in different areas of the city. This is not the same as saying that the demographic variables explain the distribution of offenses however. Correlation is not causation.

The demographic profile of the community is also related to land use in different areas of the city. For example, the city centre is zoned for high-density, multiple-family dwellings such as high-rises and walk-up apartments. This type of accommodation is attractive to single persons who are either working or going to school because it is relatively less expensive, in the short run, than owning a home. Also, being adjacent to the offices and businesses in the central business district, these residences are highly attractive to single persons working in the downtown area. Thus it is not surprising to find that the city centre ranks high in the proportion of young single males.

The high crime occurrence in the downtown area may be attributable to the rich array of opportunities for crime in this area. The anonymity

of crowds, the displays of merchandise, the concentration of banks, shops, and parked cars, hereafter referred to as environmental opportunities for crime, are relevant in this regard (Boggs, 1965). An analysis of the distribution of environmental opportunities for crime is undertaken in the next chapter.

Thus, city zoning laws and the distribution of commercial and industrial enterprise might be intervening variables which account, at least in part, for both the demographic profile of the community and the distribution of offenses. This alternative explanation of the findings can be checked further. Other areas ranked high in crime and high in the categoric risk of residents might be examined to see if the preceding discussion holds for them as well. Table 3 identifies Areas 200, 201, 203, and 208 as being ranked high, both in respect to crime and single males 15-54. It is interesting to note that, in common, these areas have (City of Edmonton, Planning Dept., Land Use Map, 1968):

- a) Substantial concentrations of commercial enterprise,
- b) A considerable concentration of medium density residences,
- c) Areas devoted to industrial uses, and
- d) A major transportation artery passing directly through the area.

Table 3 shows Area 206 and 213 to be low, both in respect to offenses and young single males. They are uniformly low in respect to the structural features which characterize high crime/high categoric risk areas noted above (City of Edmonton, Land Use Map, 1968).

CONCLUSIONS: CRUDE AND 'CORRECTED' OFFENSE RATES
FOR THE CITY CENTRE, AND THE CATEGORIC
RISK OF THE RESIDENT POPULATION

Two inferences can be drawn from the preceding analysis. In the first place, the 'corrected' offense rate calculations for the city centre are a modest improvement over conventional population-based measures. As noted earlier in the chapter, population-based rates are typically calculated in reference to the resident population alone, thus creating spuriously high offense rates for the city centre.

Secondly, the relationship found between the categoric risk of the resident population and the distribution of offenses contributes little to the problem of explaining regional variations in offenses. The use of very large geographic units of analysis makes the assumption of coincidence between area of crime occurrence and residence of offenders less critical. Simultaneously, however, the analysis becomes increasingly less sensitive to regional variation as the geographic units of analysis get larger. It would not be an exaggeration to suggest that the use of such large geographic units of analysis obscures more than is revealed about the relationship under study.

This is particularly true in light of finding that the distribution of young single males is also related to the distribution of environmental opportunities for crime. The next chapter reflects an attempt to illuminate the relationship between the distribution of environmental opportunities for crime and the distribution of offenses.

CHAPTER III

ENVIRONMENTAL OPPORTUNITIES FOR CRIME

The distinctive characteristic of research in this category is the introduction of measures of criminal opportunity into the denominator of rate calculations. The work of Sarah Boggs (1965) is a case in point. She concedes that conventional measures (offender rates) using population in the denominator of rate calculations may be useful in explaining the criminal propensity of residents in an area. On the other hand, they create spuriously high occurrence rates for the central business districts which contain few residents and large numbers of targets such as merchandise in stores and untended cars in parking lots which invite criminal attack. A valid occurrence rate, she contends, should be based on the risk or target group appropriate to each specific crime category. Thus, for example, the rate of residential burglary should be stated as a ratio of the number of residences burglarized over the number of residences that could have been burglarized.

In her study, Boggs used a residential-business land use ratio as a denominator for offenses such as business robbery, non-residential burglary, and grand larceny. Similarly, space devoted to parking was related to auto thefts. In the absence of a daytime population count, the number of square feet of streets was used as the crime specific base for highway and street robberies.

Boggs' findings demonstrate that on the basis of crime-specific rates, census tracts with small resident populations but with much

business and commerce ranked among the lowest in the city. Conventional population-based rates for the same tracts were among the highest in the city. In summarizing her research, Boggs recommends the development of more sensitive estimates of crime targets to provide better indices of environmental opportunities for crime.

Two measures pertaining to the distribution of opportunity have been devised. In the order in which they will be discussed, they are 'opportunity indices' and rate calculations using the Edmonton Police Department 'property count' in the denominator.

ENVIRONMENTAL OPPORTUNITY INDICES

Opportunity indices are crime-specific indicators intended to highlight the criminal attractiveness of certain structural and social configurations of land use. In this regard, two indices have been created; one pertaining to licensed hotels and a second pertaining to shopping centres. Both of these facilities occupy prominent positions in the socio-economic life of the community and both provide an array of opportunities for specific types of crimes.

The assumption underlying the ensuing analysis is that occurrences of specific crimes tend to cluster in areas high in opportunity for their commission. [The smallest geographic units for which data are available are polling locations (N=267). Polling locations are the enumeration areas for municipal elections and have an average population size of approximately 2000 persons] In an effort to control for extraneous variables, including other opportunity concentrations, the hotels and shopping centres chosen for intensive study exhibit the following common features:

- a) They are isolated to the extent that they are surrounded by suburban residential polling locations, and
- b) They each represent a single prominent opportunity complex in their respective polling locations.

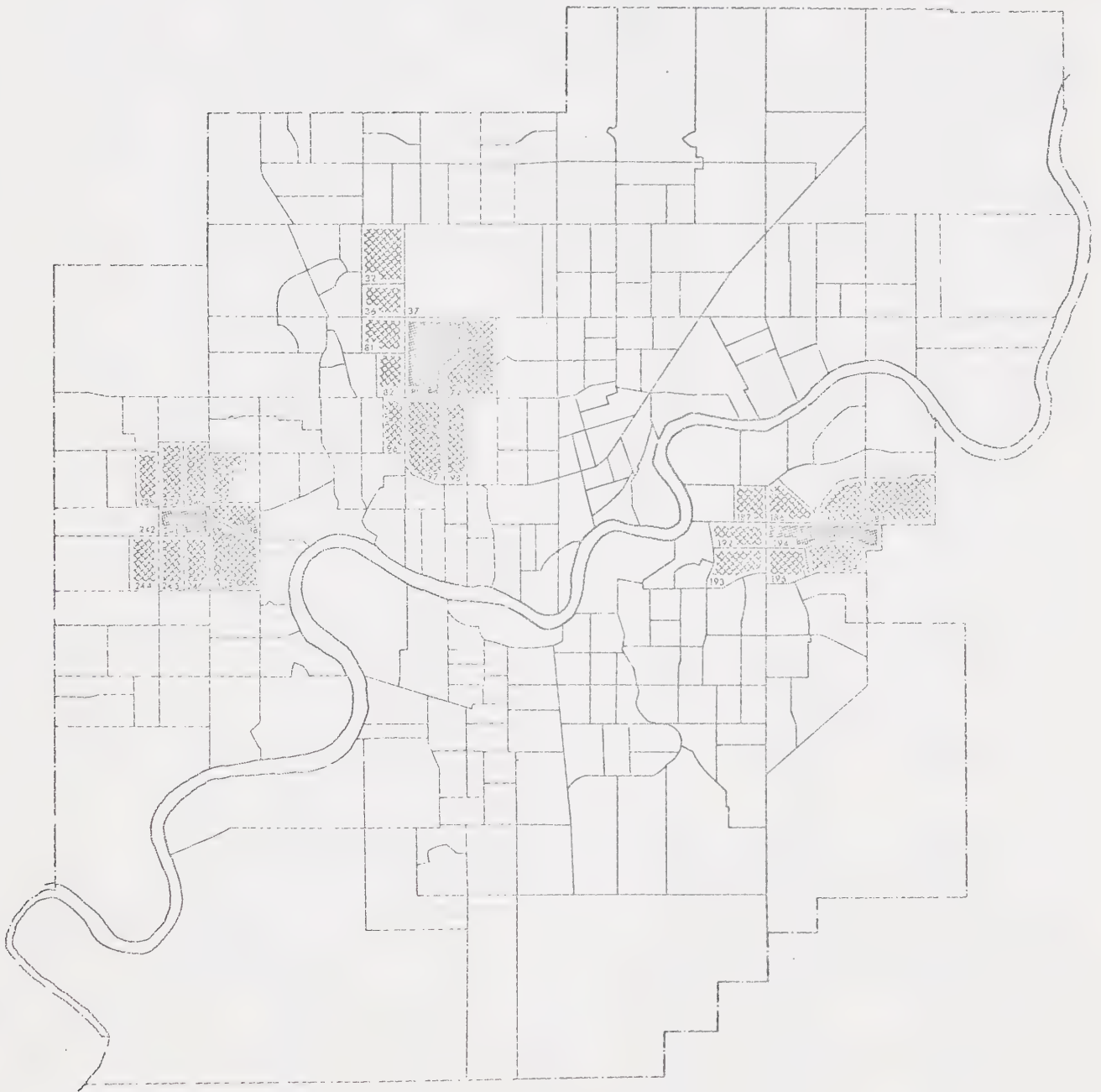
Licensed Hotels as Environmental Opportunities for Crime

It is suggested that the structure and social relevance of licensed hotels contribute to distinctive patterns of criminality associated with their presence. Structurally, one would expect the concentration of parked cars, either in lots or surrounding streets, to maximize opportunity for auto thefts and theft from autos. In Tables 5, 6, and 7 they are referred to as 'Auto Crimes.' Socially, their bars may generate a high rate of occurrence for such offenses as common assault, disorderly conduct, and violations of the Liquor Act. These offenses are referred to as 'Bar Crimes' in the succeeding tables and discussion.



Looking at Figure 2, polling locations 241, 80, and 194 contain hotels while those surrounding them do not. [Area 242 has a shopping centre in it and Area 37 is the industrial airport. They were omitted from the analysis because they didn't meet criterion (a) noted above.]

FIGURE 2

SELECTED POLLING LOCATIONS WITH LICENSED HOTELS, AND ADJACENT AREAS, EDMONTON: 1966



LEGEND

-  POLLING LOCATIONS WITH HOTELS (241, 80, 194)
-  ADJACENT AREAS

Tables 5, 6, and 7

Comparison of Auto related and Bar related
Offenses Known to the Police for Polling
Areas with Hotels and Adjacent Areas
Edmonton: 1968

		OFFENSES				
		Auto Crimes	Bar Crimes	Total Crimes	Total Pop.	Crude Rate/ 1000 Pop.
5	Hotel Area	241	96	348	444	1278
						347
		137	10	10	20	1319
		138	10	41	51	862
		139	16	21	37	1020
		239	22	37	59	1473
		240	15	29	44	1518
		244	9	16	25	1232
		245	10	24	34	1262
		246	14	13	27	1424
Average		14	24	40	1264	31
6	Hotel Area	80	37	110	147	1332
						110
		32	22	35	57	1320
		36	23	65	88	1169
		79	22	37	59	639
		81	15	25	40	1768
		82	23	19	42	1367
		96	5	19	24	1030
		97	23	13	36	791
		98	31	41	72	2513
Average		21	39	53	1325	40
7	Hotel Area	194	39	39	78	2013
						38
		183	13	22	35	2709
		185	23	19	42	1921
		186	17	21	38	1474
		187	12	15	27	1092
		192	12	20	32	1353
		193	11	10	21	1973
		195	8	8	17	1460
		264	6	13	19	1909
Average		13	16	29	1736	17

**Findings: Intra-regional comparison of areas with hotels
and adjacent areas without hotels**

The foregoing assumptions can be checked by examining Tables 5, 6, and 7. Looking first at auto offenses (Table 5) which include auto theft and thefts from autos, Area 241 has 96 cases while adjacent areas average 14 cases. Tables 6 and 7 exhibit the same pattern. Polling location 80 has 37 auto offenses compared with an average of 21 for the surrounding areas, while Polling location 194 has 39 cases compared with an average of 13 in contiguous areas. These findings appear to attest to the criminal attractiveness of concentrations of parked cars.

The assumptions in respect to the incidence of crimes reflecting personal disorganization can be checked in the same way. Assaults, instances of disorderly conduct, and violations of the Liquor Act have been included in this category. In Table 5, Area 241 has 348 cases compared to an average of 24 for the others. This pattern is also evident in Tables 6 and 7. In each case the polling location with the hotel has more crimes reflecting personal disorganization than the average of adjacent areas.

Admittedly, each crime in Polling locations 241, 80 and 194 cannot be attributed to the presence of a licensed hotel. However, the presence of a licensed hotel is the only criterion by which these areas can be structurally differentiated from those surrounding them. Thus it seems reasonable to conclude that the number of crimes in excess of the average for the surrounding areas reflects the opportunities for criminality associated with the presence of licensed hotels.

Several alternate explanations might be advanced to account for these findings, however. For crimes reflecting personal disorganization

such as assault, disorderly conduct, and violations of the Liquor Act, the literature (Schmid, 1960a: 660) evidences a high degree of coincidence between the area of occurrence and the residence of offenders. On this basis one could argue that the high incidence of these crimes in areas with hotels could be due to the demographic characteristics of the residents in these areas.

If polling locations with hotels were compared to adjacent polling locations and found to be lower in respect to single family dwellings, education, and income, and higher in respect to the proportion of young single males, there would be a basis for explaining the findings on the basis of these demographic variables. Areas high in crimes of personal disorganization have been consistently characterized in the foregoing manner.

This was not found to be the case. In each instance the hotel areas and surrounding polling locations were found to be alike, both in respect to land use and the demographic characteristics of their residents (McVey, 1971). It will be remembered that the comparability of areas with hotels and surrounding polling locations was the major control used in their initial selection.

One might also argue that the concentration of crimes in areas with hotels could be a result of larger populations in those areas compared to adjacent locations. In the preceding chapter, the population base for the city centre was corrected to include the influx of persons into that area. Since there is almost certainly a similar influx of persons into the areas with hotels, it would be misleading to compare areas on the basis of population-based crude rates.

**Summary: Intra-regional comparison of areas with hotels
and adjacent areas without hotels**

The insurance incentive for reporting auto thefts and the public nature (high visibility) of bar offenses offers assurance of high reportability for these offenses across all areas. This adds support for the assertion that the distinctive pattern of criminality evidenced in the data is in fact due to the presence of the licensed hotels.

Findings: Inter-regional comparison of areas with hotels

Having established differences in patterns of criminality within regions of the city, polling districts 241, 80, and 194 were compared in order to assess inter-regional differences. To effect a comparison between these areas a series of crime-specific opportunity indices were derived.

The Auto Index:

Table 8

**Index of Auto Offenses
For Hotel Parking Lots**

From Table	Polling Location	Auto Crimes	Parking Stalls	Auto ^a INDEX
5	241	96	800*	.120
6	80	37	900	.041
7	194	39	400	.098

^aAuto Crimes ÷ Parking Stalls

*Includes Theatre parking across street

The auto index is a ratio of the number of auto-related offenses over the number of parking stalls, the crime-specific opportunity

structure. Thus Polling location 241 with 96 auto offenses and 800 parking stalls has an index of $96 \div 800 = .120$. The auto indices for Areas 80 and 194 were derived in the same manner.

Assuming that the number of parking stalls is an adequate measure of opportunity for auto thefts and thefts from autos, the auto indices are measures of the extent to which these opportunities are exploited in the regions under study. On this basis, Polling location 241 which has an auto index of .120 could be singled out as a 'problem area.' Opportunity concentrations in Areas 80 and 194 are seemingly less criminally attractive, as evidenced by their smaller indices.

The Bar Index:

The bar index is intended to highlight regional differences in respect to the incidence of crimes reflecting personal disorganization.

Table 9

Index of Crimes Reflecting Personal Disorganization for Hotel Bars

From Table	Polling Location	Bar Crimes	Bar Seats	Bar ^a INDEX
5	241	348	750	.464
6	80	110	555	.198
7	194	39	495	.079

^aBar Crimes \div Bar Seats

The bar index is a ratio of the number of crimes reflecting personal disorganization over the number of seats in the bars. Polling location 241 with 348 cases and a seating capacity has an index

of $348 \div 750 = .464$. The bar indices for Areas 80 and 194 were calculated as above and found to be .198 and .079, respectively.

The seating capacity of the bar is taken to be a measure of opportunity conducive to the occurrence of crimes reflecting personal disorganization. On this basis, Polling location 241 with an index of .464 can again be singled out as a 'problem area.' There are considerably fewer crimes per available opportunity (concentration of drinkers) in Areas 80 and 194.

Combined Hotel Opportunity Index:

It might be possible to combine the preceding indices in such a way that the extent to which the various specific opportunities are exploited can be represented by a single opportunity index.

Table 10

Combined Environmental Opportunity Index For Hotels: Auto and Bar Crimes

From Table	Polling Location	Parking Stalls	Bar Seats	Total Opportunity	Total Crimes	Combined ^a INDEX
5	241	800	750	1550	444	.286
6	80	900	555	1455	147	.101
7	194	400	495	895	78	.085

^aTotal Crimes \div Total Opportunity

In Table 10, the opportunity index indicated for each facility/area was calculated as follows. For each area the number of parking stalls was added to the number of bar seats and divided by the number of crimes occurring in the area. Thus, for Polling location 241 the total

index is $(800+750) \div 444 = .286$. Similarly, indices of .101 and .085 were calculated for Areas 80 and 194, respectively. Again, Polling location 241 emerges as the area wherein opportunities for crime are most exploited.

Adding the number of parking stalls to the number of bar seats to get the total number of opportunities assumes that parking stalls and bar seats are equally weighted in terms of their contribution to criminality. Similarly, if one assumes apples and oranges have equivalent nutritional value, the total number of apples and oranges would provide an index of their combined nutritional value. Although combining parking spaces and bar seats as if they had equal criminal potential may be somewhat arbitrary, there was no clear basis for assuming one to be more criminally attractive than the other. For example, in Polling locations 241, 80 and 194, the auto offenses ranged from 1 crime per 8 stalls (opportunities) in Area 241 to 1 crime per 24 stalls in Area 80. In respect to bar offenses, the areas vary from 1 crime per 2 seats in Area 241 to 1 crime per 12 seats in Area 194. Subsequent studies may show this procedure to have been in error, but for the moment the combined opportunity index for each area appears to be a valid indicator of regional variations in respect to the incidence of the offenses considered.

Summary: Inter-regional comparison of areas with hotels

It has been argued that the comparison of auto, bar, and combined opportunity indices increases our knowledge of regional variation in the distribution of specific offenses. These indices do not explain the variation, however. At least three factors may be relevant in explaining the regional differences detected in the foregoing analysis.

Unfortunately, it was not possible to properly assess the explanatory power of these factors in this thesis.

In the first place, there may be qualitative differences in the nature of the opportunities themselves. For example, the parking lot in one area may be well lighted and therefore less criminally attractive than the parking lots in other areas. Likewise, some bars may be more crowded which in turn may precipitate more interpersonal conflict. In addition, there may be variations in the extent to which bar managers tolerate deviance. The bartenders in one facility may stop serving patrons at the first sign of drunkenness while others may continue to dispense beverages. While occasional shouting or standing on a table may be tolerated in one bar, the same behavior may be reported to the police in others.

Secondly, and related to the foregoing, different bars may be found to have a qualitatively different clientele. One facility may serve persons of relatively high status whose deviance is either not reported, less frequent, or both. Other bars may cater to a less restrained clientele which is not offered the preferential treatment afforded those noted above.

Thirdly, there may be regional variation in patterns of law enforcement. Concentrations of police in an area may increase the visibility and therefore the reportability of offenses for that area. Admittedly, a concentration of police may have the reverse effect. However, in respect to crimes which by definition consist of aggressive and uncontrollable drunken behavior, it seems more reasonable to expect concentrations of police to increase rather than decrease the visibility/reportability of offenses.

Conclusions: Hotels as Environmental Opportunities for Crime

The contention that certain configurations of land use contribute distinctive patterns of criminality has been demonstrated in respect to licensed hotels and crimes such as assault, disorderly conduct, violations of the Liquor Act, and auto-related offenses. It seems reasonable to conclude that increasingly precise descriptions of the distribution of offenses demand correspondingly precise measures of the explanatory variables. What these explanatory variables are is in turn related to the measure by which the distribution was mapped. The nature of the opportunity, the characteristics of the clientele, the police enforcement policy and manpower deployment have been implicated in this regard. Unfortunately, it was impossible to properly assess their explanatory power. Prolonged and intensive observation may expose significant regional variation in respect to the explanatory variables enumerated above. Also, data pertaining to offenders would facilitate sensitive appraisal in respect to differences in clientele. By observing the police at work in the different regions, the nature and extent of law enforcement could be attained.

The indices themselves would be improved if offense data were available by street address rather than by some larger geographic region as is now the case. If such data were available, it would be possible to tell precisely how many offenses occurred on the premises of the facility under study. This is clearly preferable to attributing those crimes in excess of the average for adjacent polling locations to the hotels, as was done in the current study. In turn, the indices would be more precise indicators of the extent to which opportunities for criminality are exploited in and around the various facilities one chooses

to study.

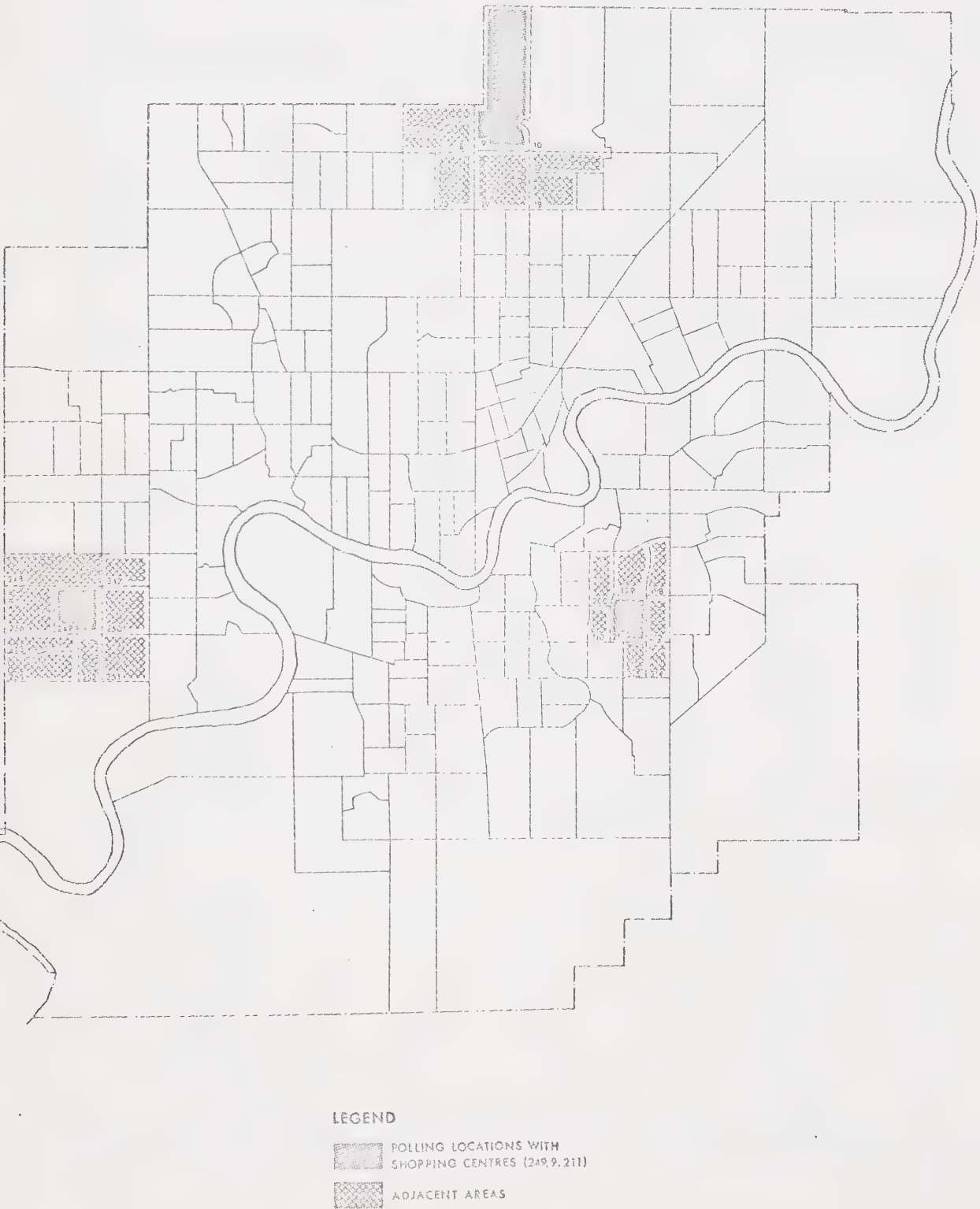
Shopping Centres as Environmental Opportunities for Crime

Shopping centres, like licensed hotels, offer a variety of crime-specific opportunities. Here again, their massive parking lots provide opportunities for auto theft and thefts from autos. These offenses are labelled 'Auto Crimes' in Tables 11, 12, and 13. The retail businesses provide opportunity for thefts, listed under 'Thefts' in the succeeding tables. In addition, shopping centres provide opportunities for fraud and shopbreaking, and since the centres provide an attractive 'hangout' or meeting place for youth, a corresponding variety of opportunities for mischievous behavior as well. These offenses are listed as 'Fraud, Shop-breaking, and Mischief' in the succeeding tables, and are referred to collectively as miscellaneous offenses in the discussion.

See Figure 3. Polling locations 9, 249, and 211 contain shopping centres while those surrounding them do not. (Polling location 10 was not considered in the subsequent analysis because, like location 9, it has several retail outlets.)

Figure 3

SELECTED POLLING LOCATIONS WITH SHOPPING CENTRES,
AND ADJACENT AREAS. EDMONTON: 1966



Tables 11, 12, and 13

Comparison of Offenses Known to the Police
For Areas with Shopping Centres and
Adjacent Areas. Edmonton, 1968.

		OFFENSES						
		Auto Crimes	Thefts	Fraud Shopbreak Mischief	Total Crimes	Total Pop.	Crude Rate/ 1000 Pop.	
Shopping Centre Area	9	61	115	57	233	2153	108	
11	Adjacent Areas	7	13	25	15	53	2025	26
		8	18	26	9	53	1761	30
		17	11	36	13	60	1988	30
		18	21	35	17	73	2473	29
		19	32	44	39	115	2427	47
		20	13	33	18	64	2624	24
	Average	18	33	27	70	2206	31	
Shopping Centre Area	211	43	104	52	199	1023	194	
12	Adjacent Areas	198	9	18	10	37	1421	26
		199	15	36	8	59	2029	29
		200	10	20	7	37	1312	28
		210	10	23	13	46	1022	45
		212	9	12	14	35	1204	29
		214	7	13	6	26	1204	21
		215	16	22	11	49	1295	37
Average	11	13	8	40	1355	30		
Shopping Centre Area	249	28	77	33	138	2278	60	
13	Adjacent Areas	247	13	28	11	52	1704	30
		248	6	31	4	41	1860	22
		250	22	48	17	87	2551	34
		251	13	28	6	47	1969	23
		252	8	24	13	45	1565	28
		253	22	32	5	59	2076	28
		256	17	29	7	53	1725	30
Average	14	31	9	55	1921	28		

Findings: Intra-regional comparison of areas with shopping centres and adjacent areas without shopping centres

Parallel with earlier assumptions, the areas containing shopping centres should have proportionately more offenses than the surrounding polling locations. This assumption can be checked by referring to Tables 11, 12, and 13.

Looking first at auto offenses, Area 9 (Table 11) has 61 cases as compared with an average of 18 in adjacent locations. A similar pattern is found in respect to Areas 211 and 249 depicted in Tables 12 and 13, respectively. In each case the area with the shopping centre has more offenses than adjacent areas. Parallel with the discussion of hotel lots, these data seem to testify to the criminal attractiveness of concentrations of parked cars around shopping centres.

The assumptions in respect to the incidence of thefts can be checked in the same way. In Table 11, Area 9 has 115 cases compared with an average of 33 cases in contiguous areas. Similarly, in Tables 12 and 13, Areas 211 and 249 have considerably more offenses than the polling locations surrounding them.

The assumption in regard to fraud, shopbreaking, and mischief can also be assessed by referring to Tables 11, 12, and 13. In Table 11, Area 9 has 57 cases compared to an average of 27 in surrounding areas. A similar pattern prevails with respect to Area 211 in Table 12 and Area 249 in Table 13.

As in the case of hotels, each crime occurring in polling locations 9, 211, and 249 cannot be attributed to the presence of the shopping centre. Again, however, the presence of shopping centres in these areas is the only criterion by which the Areas 9, 211, and 249 can

be structurally differentiated from those surrounding them. Thus it again seems reasonable to conclude that the number of crimes in excess of the average for surrounding areas is a reflection of the criminal opportunities associated with the presence of shopping centres.

Except for the presence of shopping centres in Areas 9, 211, and 249, these areas are the same as adjacent areas in respect to housing density, the demographic characteristics of residents, and land use. Again it will be remembered that the comparability of hotel and surrounding areas was the major criterion used in their initial selection. This adds confidence to the assertion that the differences in criminality are due to the presence of hotels.

Comparing polling locations with shopping centres to their neighbors on the basis of the population-based crude rate in each, the areas with shopping centres are substantially more criminal than adjacent locations. Table 11 shows that Area 9 has 108 cases per 1000 population compared to an average of 31 per 1000 population in adjacent areas. A similar pattern prevails in respect to Areas 211 and 249 as evidenced by Tables 12 and 13. Remembering the 'corrected' population-based offense rates calculated for the central business district in the preceding chapter, one could argue that the rates for areas with shopping centres are spuriously high. The large influx of shoppers should realistically be added to the rate calculations for these areas. If this were done, the disparity between the areas with shopping centres and surrounding polling locations would be reduced, if not inverted. Thus uncorrected population-based rates do not seem appropriate for analyses in respect to opportunity structures.

Summary: Intra-regional comparison of areas with shopping centres and adjacent areas without shopping centres

It was assumed that certain configurations of land use contribute distinctive patterns of criminality. This was confirmed earlier in respect to hotels. The preceding analysis has confirmed this assumption in regard to shopping centres and the occurrence of such crimes as auto theft, theft, and miscellaneous offenses such as fraud, shopbreaking and mischief.

Findings: Inter-regional comparison of areas with shopping centres

Having established differences in the pattern of criminality within regions of the city, Areas 9, 211, and 249 were compared in order to assess inter-regional differences. As in the case of hotels discussed earlier, a series of crime-specific opportunity indices were devised to facilitate comparisons among regions.

The Auto Index:

Table 14

Index of Auto Offenses for Shopping
Centre Parking Lots

From Table	Polling Location	Auto Crimes	Parking Stalls	Auto ^a INDEX
11	9	61	2000	.031
12	211	43	2210	.019
13	249	28	1800	.016

^aAuto Crimes ÷ Parking Stalls

The auto indices in Table 14 were calculated as before. For Area 9, for example, the number of cases (n=61) divided by the number of parking stalls (n=2000) yields an index of .031. The indices thus serve as a measure of the extent to which similar targets in different areas are exploited. Opportunities in Area 9, which has an auto index of .031, are more frequently victimized than are the opportunities in Areas 211 and 249 which have indices of .019 and .016, respectively.

The Theft Index:

Table 15

Index of Thefts for
Shopping Centres

From Table	Polling Location	Thefts	Retail Space/ 1000 sq. ft.	Theft ^a INDEX
11	9	115	270	.425
12	211	104	590	.176
13	249	33	340	.226

^aThefts ÷ Retail Space

The theft index is a ratio of the number of thefts over the number of square feet of retail floor space (Table 15). Thus Area 9 with 115 cases and 270/1000 sq. ft. has an index of $115 \div 270 = .425$. Similarly, indices of .176 and .226 were calculated for Polling locations 211 and 249, respectively.

The retail floor space in the respective shopping centres, expressed in thousands of square feet, is taken to be the measure of opportunity for thefts. On this basis, Area 9, with an index of .425, could be considered a high crime area.

The Miscellaneous Crime Index: Fraud, Shopbreaking, and Mischief

As noted previously, frauds, shopbreaking and mischief are included in the miscellaneous offense category. Like the other indices, the miscellaneous index is intended to identify regional variations in criminality in areas rich in opportunity for these offenses.

Table 16

Index of Miscellaneous Offenses (Fraud,
Shopbreaking, and Mischief) for
Shopping Centres

From Table	Polling Location	Fraud Shopbreak Mischief	Area of Centre (acres)	Misc. ^a INDEX
11	9	57	26.5	2.151
12	211	52	31.0	1.674
13	249	33	22.4	1.469

^aFraud, Shopbreaking, and Mischief ÷ Area of the Centre

In Table 16, the index for Area 9 was derived by dividing the number of crimes (n=57) by the number of acres the centre occupies (n=26.5) to yield an index of 2.151. Similarly, indices of 1.674 and 1.469 were derived for Areas 211 and 249. The area of the shopping centre was thought preferable to either the number of stores or the number of square feet of retail floor space as the crime-specific opportunity base in the foregoing calculations, since the offenses in this category include crimes which occur both in the facility and on the lot. While it could be argued that other bases would be more appropriate for individual crimes, the area of the facility appears most relevant to this category of offenses.

Accepting the area of the shopping centre as a valid base for regional comparison, Area 9, with an index of 2.151, is again the problem area. The shopping centre in this area is more frequently victimized than are the centres in the other areas.

A combined opportunity index like that calculated in respect to hotels was not derived for the individual shopping centres. It will be remembered that equal weights were assigned to parking stalls and bar seats in the former case. In respect to shopping centres, combining acres, retail floor space, and parking stalls was somewhat more problematic. There was no clear basis for assigning weights to these three opportunity bases. As such, arbitrary weighting was judged more likely to obscure the previous findings than contribute further illumination in respect to regional differences. Area 9 was the highest on all three indices, and this alone seems sufficient to judge it as being more criminally attractive than the other regions.

Summary: Inter-regional comparison of areas with shopping centres

Like the hotel indices, the shopping centre indices identify but do not explain regional variations in the extent to which opportunities for criminality are exploited. Several factors may be relevant in explaining the regional variations detected in the preceding analysis. Regrettably, it was impossible to assess the explanatory power of the following variables within the context of this study.

As in the case of hotels, there may be qualitative differences in the nature of the opportunities in each area. Variations in the illumination and supervision of parking lots, and variations in mall supervision

would seem important. Also, store managers decide which offenders to prosecute and therefore partly control the number of offenses known to the police. The offense data may thus be more a product of store policy in respect to the handling of offenders than of regional variation in the actual number of offenses. Moreover, variations in the quality and quantity of internal security, along with variations in merchandising and display practices no doubt influence the criminal attractiveness of the respective areas. Secondly, and related to the foregoing discussion, the different shopping centres may be found to have a qualitatively different clientele. Also, one might be tempted to argue that variations in population size contributes to regional variation in offenses. However, since 'corrected' population-based offense rates could not be calculated for each of the facilities, it is felt that inter-regional comparison of population-based rates would be misleading.

Thirdly, there may be regional differences in respect to the deployment of police personnel. Conceivably, more police in an area might increase the visibility of offenses therein. This in turn might account for some of the regional variation in incidence of offenses detected in the preceding analysis.

Conclusion: Shopping Centres as Environmental Opportunities For Crime

The preceding analysis demonstrates that shopping centres contribute to distinctive patterns of criminality in the areas in which they are located. The use of opportunity-based measures in mapping the distribution of offenses leads one to consider the nature of the opportunity structure, the characteristics of the clientele and the pattern of police patrol as explanatory variables. Precise measures of these

variables are needed before their explanatory power can be fully assessed. Hence, prolonged and intensive study of the individual shopping centres is clearly called for in subsequent studies. Repeating what was said in respect to hotels, data pertaining to offenders would facilitate a more sensitive appraisal in respect to differences in clientele. By observing the police at work in the different regions, the influence of variations in law enforcement could be attained. Also, it is worth repeating that if offense data were available by street address the indices would be even more sensitive measures of the extent to which similar opportunities are exploited in different parts of the city.

OPPORTUNITY-BASED RATE CALCULATIONS: A SECOND MEASURE OF OFFENSES RELATIVE TO THE DISTRIBUTION OF ENVIRONMENTAL OPPORTUNITIES FOR CRIME

At the beginning of this chapter it was noted that two measures pertaining to the distribution of environmental opportunities for crime had been devised.

The use of property-based rate calculations in mapping the distribution of offenses involves the same logic that guided the previous analysis. Property-based rates, like the hotel and shopping centre indices, are a ratio of crimes over the number of environmental opportunities for their commission.

The idea of property-based rates derives from the crime prevention aspect of police patrol. Officers on patrol during the hours of midnight to 8:00 A.M. make intermittent checks of commercial and industrial properties in their respective patrol districts. For each patrol district, the police have derived a 'property count' which refers to the number of businesses which are checked. In making this count, the Hudson's Bay

store downtown is counted as one piece of property: a shopping centre with 27 separate stores counts as 27 pieces of property.

This dimension of enforcement shows an explicit recognition on the part of the police that untended businesses are both criminally attractive and highly vulnerable during the early hours of the morning. Hence the property count in an area is a crude measure of environment opportunities for the commission of crimes such as breaking and entering. It can be further argued that the property count provides a basis for the calculation of crime-specific offense rates.

In calculating the environmental indices for crime, it was argued on intuitive grounds that the incidence of auto offenses was related to the presence of concentrations of parked cars. Similarly, the occurrence of crimes reflecting personal disorganization would be expected in areas with concentration of drinkers. Here it is asserted that the offense of breaking-and-entering is related to the distribution of property, and that breaking-and-entering offenses would be a suitable numerator in property-based rate calculations.

In Chapter II it was demonstrated that 'time of day' is an important factor in the calculation of population-based rates for the city centre. Like the police, it seems reasonable to conclude that 'property' is most vulnerable during the early morning hours and thus time is equally relevant in respect to property-based rates. Consequently, only those offenses occurring between midnight and 8:00 A.M. should be considered in the numerator.

A Comparison of Population-Based Offense Rates and Property-Based Offense Rates for Selected Patrol Districts

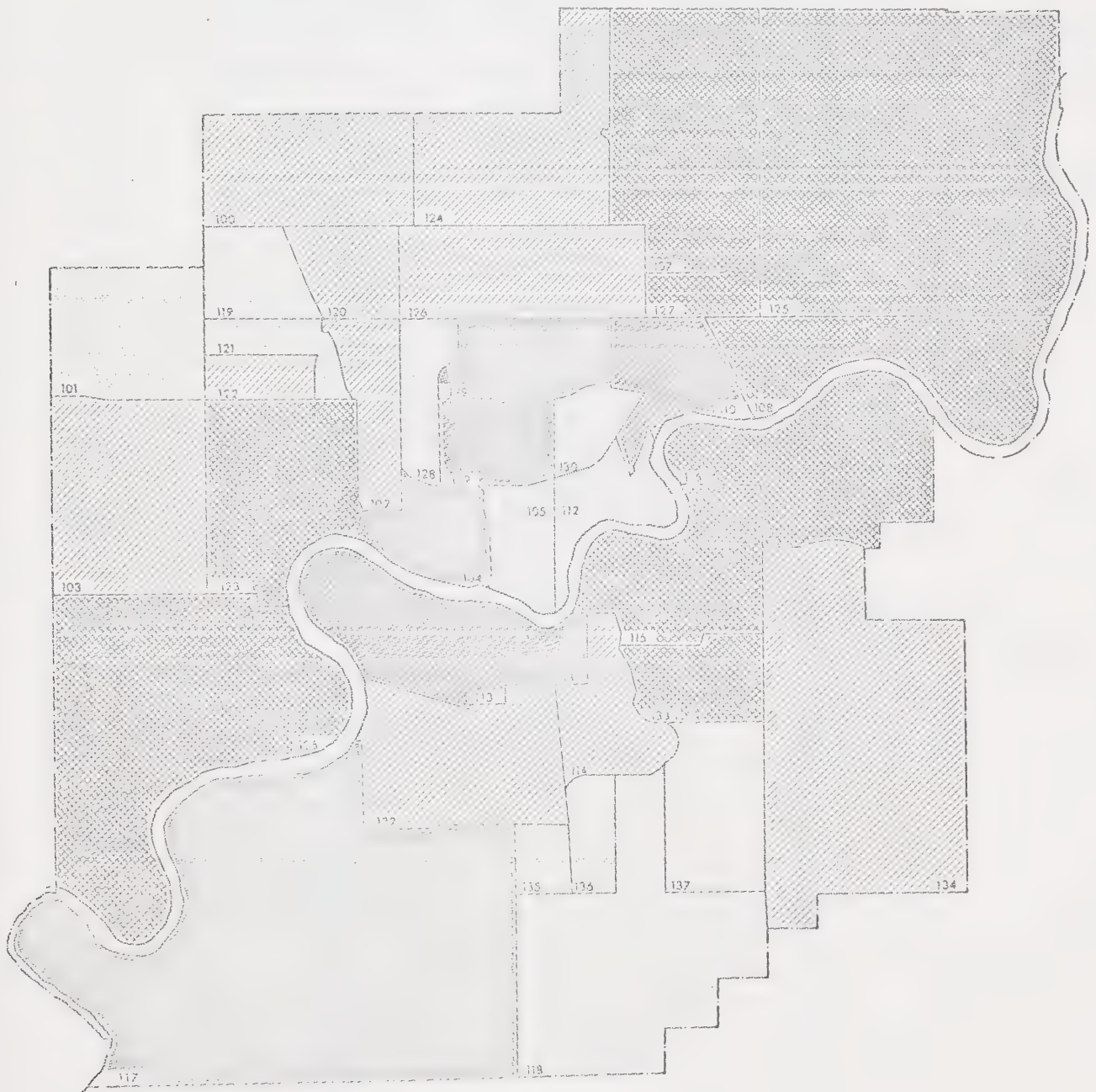
Earlier in this chapter, reference was made to Boggs (1965) who

suggested that conventional population-based measures create spuriously high offense rates for areas rich in opportunities for crime and low in population. It was further argued that the distribution of property was a valid indicator of the distribution of environmental opportunities for breaking-and-entering. To check these assumptions in the context of the present discussion, the ranking of areas on the basis of population-based offense rates and property-based offense rates for patrol districts was compared. Patrol districts (n=36) are much larger than the polling locations (n=267) used in the previous analysis. The patrol districts used in this analysis are the geographic areas patrolled by the police officers on duty between the hours of midnight to 8:00 A.M.. The change to this unit of analysis was necessitated by the fact that both data pertaining to 'pieces of property' and offenses occurring between midnight and 8:00 A.M. are available for these areas only (see Figure 4).

The population-based breaking-and-entering rates were calculated on the basis of the number of offenses over the total resident populations. The property-based rates were calculated on the basis of the number of offenses over the property count (Edmonton Police Dept., 1966, increased 10% for city growth) for each area. (The distribution of property-based offense rates is illustrated in Figure 4.) On the basis of these rate calculations, the areas were ranked from 1 (least criminal) to 36 (most criminal), as illustrated in Table 17.

Figure 4

PROPERTY BASED OFFENSE RATES FOR BREAKING AND
ENTERING OCCURRING BETWEEN 12 P.M. AND 8 A.M.
POLICE PATROL DISTRICTS, EDMONTON: 1968



LEGEND

NUMBER OF OFFENCES PER
10 PIECES OF PROPERTY

1-15

16-30

31-45

46-60

60 AND OVER

Table 17

Patrol Districts Ranked on the Basis of Population-
And Property-Based Breaking-and-Entering Rates for
The Period 12 P.M. to 8 A.M.. Edmonton: 1963

Patrol District	Rank	
	Population- Based Rate	Property- Based Rate
100	3	13
101	36	3
102	20	12
103	16	20
104	26	36
105	34	7
106	5	24
107	10	29
108	14	22
109	25	32
110	23	30
113	4	31
114	11	11
115	12	28
116	15	27
117	2	34
118	27	10
119	28	6
120	24	16
121	8	1
122	35	19
123	13	26
124	7	15
125	9	21
126	17	18
127	31	23
128	32	8
129	22	33
130	18	9
131	30	35
132	1	14
133	21	25
134	6	17
135	29	4
136	33	2
137	19	5

The argument that population-based rates create spuriously high offense rates for areas low in population but high in environmental opportunities for crime was first examined by reference to specific patrol districts. Constructed on the basis of the data in Table 17, Table 18 shows patrol districts ranked highly criminal on the basis of population-based rates and low on the basis of property-based rates. Table 19 shows selected patrol districts ranked low on the basis of population-based rates and high in respect to property-based rates.

Table 18

Selected Patrol Districts Ranked Highly Criminal on
The Basis of Population-Based Rate Calculations and
Low on the Basis of Opportunity-Based Rates
(1=Lowest, 36=Highest, N=36)

Patrol District	Rank	
	Break-and-Enter/ 1000 Population	Break-and-Enter/ 1000 Pieces of Property
101	36	3
105 & 112	34	7
136	33	2

In Table 18, Patrol districts 101, 105 and 112, and 136 with ranks of 36, 34, and 33, respectively, are among the most criminal in the city on the basis of population-based rates. On the basis of the property-based rate calculations, these same areas ranked among the least criminal in the city with ranks of 3, 7, and 2, respectively.

Figure 4 shows that Patrol districts 101 and 136 are on the North-west and South-east periphery of the city, respectively. Each is

characterized by a low population and land devoted to industrial uses such as warehousing, trucking terminals, and light manufacturing. Patrol districts 105 and 112 have been grouped to include the entire central business district. Like Districts 101 and 136, they are low in population and high in opportunity for breaking and entering.

Table 19

Selected Patrol Districts Ranked Low on the Basis of
Population-Based Crime Rates and High on the Basis
Of Opportunity-Based Rate Calculations
(1=Lowest, 36=Highest, N=36)

Patrol District	Rank	
	Break-and-Enter/ 1000 Population	Break-and-Enter/ 1000 Pieces of Property
106	5	24
107	10	29
117	2	34

Table 19 shows a reversal of the change noted above. Ranked on the basis of conventional population-based measures, Areas 106, 107, and 117 with ranks of 5, 10, and 2, respectively, are among the least criminal areas in the city. Ranked according to a ratio of crimes to opportunity, they appear among the most criminal in the city. Figure 4 shows that Patrol districts 106, 107, and 117 are suburban areas. While being low-density residential areas, they are characteristically high in population and low in opportunity.

A Comparison of Population-Based and Property-Based Offense Rates for All Patrol Districts

To see whether the preceding findings could be generalized to the rest of the city, the following analysis was carried out. Using the data presented in Table 17, a rank order correlation (Spearman's rho) was calculated in order to assess the impact of the change in measurement across all patrol districts.

Findings: Rank order correlation of population and property-based offense rates for all patrol districts

The rank order correlation of the crude and property-based rates yielded a rho of $-.238$ (significant at .10 level). This statistic denotes a substantial change (inversion) in the rank order of the areas under study, and suggests that the relationships identified in Tables 18 and 19 hold for the entire city. Population-based break-and-enter rates do appear to be spuriously high relative to rates calculated on the basis of environmental opportunities for their commission.

Summary: The comparison of population and property-based offense rates

It was assumed that the property count is a valid measure of opportunity for breaking and entering. Subject to the validity of this assumption, the findings support the argument that conventional population based rates provide a distorted picture of what constitutes a high crime area in respect to the incidence of breaking and entering.

Like the indices of environmental opportunities for crime, the property-based offense rates are not as sensitive as one would like. The sensitivity of the opportunity-based measures is determined by the size of the geographic units for which the data are available. When both

offenses and opportunities can be expressed by street address, the relationship between specific offenses and environmental opportunities for their commission can be subjected to more powerful analytical techniques than was possible in the current study.

This in turn would allow one to ascertain the validity of the measures. In respect to property-based offense rates, if it could be demonstrated that the properties included in the police 'property count' include the vast majority of facilities which are broken into, one would have demonstrated their validity. Until such time as the validity of property-based rates can be tested, the analysis of opportunity-based rates and the inferences drawn therefrom rest on the intuitive assumption that pieces of property intimately relate to the incidence of breaking and entering.

CONCLUSIONS: ENVIRONMENTAL OPPORTUNITIES AND THE DISTRIBUTION OF OFFENSES

In this chapter, an attempt has been made to apply and evaluate measures of criminality which reflect the distribution of opportunity for different types of crime. The creation of opportunity indices and the use of property-based offense rates contribute two new measures to the repertoire of techniques which characterize this category of ecological analysis. The preceding pages testify to one of the principal observations underlying this thesis: namely, that how the distribution of a phenomenon is measured influences how that distribution is to be explained.

The comparison of areas with hotels/shopping centres with adjacent polling locations showed that the environmental opportunities for criminality associated with these facilities contributed to distinctive

patterns of criminality in the areas where they were located. These patterns of criminality were explained in reference to the opportunities in the area.

Environmental opportunity indices were calculated in an attempt to illustrate regional variations in the extent to which opportunities for crime are exploited. In turn, it was suggested that very sensitive analysis of the nature of the opportunities, the characteristics of the clientele and the deployment of the police might explain the regional variations noted.

The fundamental limitation of these indices is that in each case the validity of the index rests in the intuitive assumption that its base is a valid measure of the respective environmental opportunities for crime. It was noted that if offense data were available by street address, one could determine whether the auto thefts occurred in the parking lots surrounding the facilities or elsewhere. This in turn would enable one to ascertain the validity of using parking stalls as a measure of environmental opportunities for auto thefts. The validity of the other indices could be similarly assessed.

The analysis of property-based offense rates also supported the argument that the distribution of specific offenses is related to the distribution of opportunities for their commission. Like the indices, this finding is tempered by the fact that the validity of the measure could not be demonstrated. Notwithstanding the preceding limitations, the current study has opened new avenues for studying and explaining the distribution of offenses.

In addition, the findings in this chapter appear to have practical applications as well. Knowing about the pattern of criminality

associated with structures such as hotels and shopping centres, one may be able to predict changes in the volume and pattern of criminality accompanying shifts in the ecology of the community.

On the basis of the preceding analysis, for example, one could predict the pattern of criminality that would come with placing a hotel or shopping centre in an area. Also, as measures of crime associated with existing facilities become increasingly precise, one would expect increasingly precise predictions of the volume and pattern of criminality coincident with construction of comparable structures.

CHAPTER IV

THE DEPLOYMENT OF POLICE MANPOWER

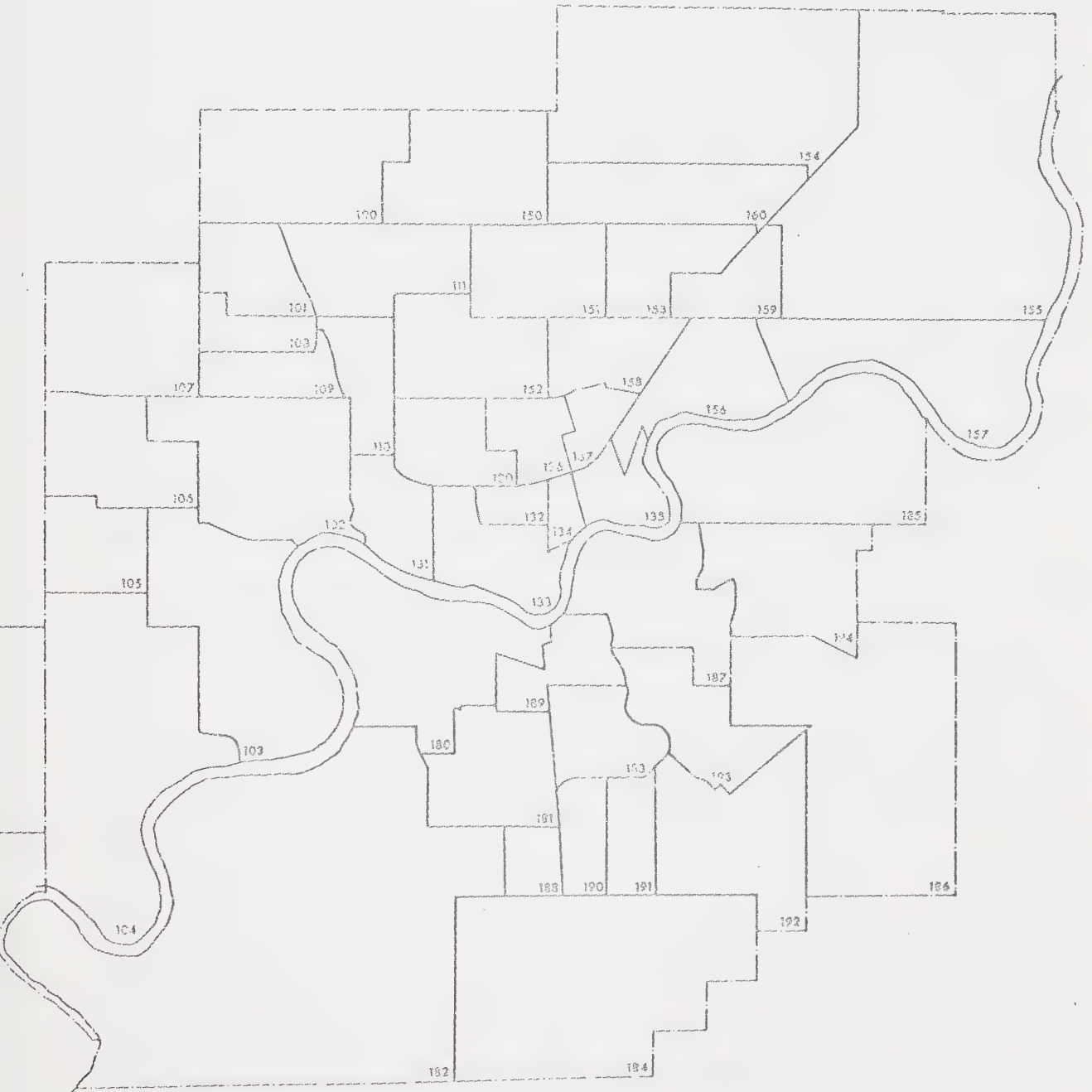
The distribution of crime can also be analyzed on the basis of how the police, the major instrument of social control, deploy their forces. Figure 5 was prepared originally by the Research and Development Section of the Edmonton City Police in the 1970 Resource Allocation Study Phase II. (All data cited in the discussion of Figure 5 are derived from this study.) It shows the recommended deployment of motorized personnel during the hours from midnight to 8:00 A.M.. The size of patrol districts was determined on the basis of the time it takes a motorized patrolman to perform the police function in each area. On the average, each patrol district in Figure 5 represents 4-1/2 hours of committed time (time spent on property checks, handling occurrences, and 'lunch' hour for the officer) and 3-1/2 hours of general patrol. Being standardized in this manner, the size of patrol districts in different areas of the city provide yet another indicator of the distribution and intensity of the crime problem.

Looking at Figure 5, there is a general increase in the size of patrol districts extending outward from the city centre. This seems to support the traditional assumptions about the ecology of crime; namely, that criminality is concentrated in the city centre and declines as one approaches the periphery of the city.

The patrol districts, in addition to being standardized on the basis of the times it takes to perform the police function in each area,

Figure 5

PROPOSED PATROL DISTRICTS
FOR FIRST WATCH (12PM-8A.M.)
EDMONTON CITY POLICE DEPT.
RESOURCE ALLOCATION STUDY: 1970



can also be broken down into the number of minutes spent in answering calls, checking property and the like. In peripheral Area 100, for example, a patrolman would spend an average of 50 minutes dealing with crime occurrences and two hours and 30 minutes checking property. In a downtown area like Patrol district 133, the patrolman would average three hours and nine minutes in dealing with occurrences and only twenty minutes checking property during the same shift. (The vast majority of property checks are made by foot patrolmen in this area. If the motorized patrolmen were responsible for property checks in the downtown area, the patrol districts would of course be even smaller, since adding to the work-load would exceed the 4-1/2 hours of committed time represented by each area.) These data, then, not only identify the city centre as being more criminal than outlying areas, but permit the differences to be expressed in the average number of minutes per eight-hour shift.

Comparing the distribution of environmental opportunity for crimes such as breaking and entering (pieces of property), suburban residential Area 182 has 78 pieces of property requiring an average of one hour and 50 minutes to check. Areas 126 and 191 in the South-east industrial section of the city each have 158 pieces of property which takes just over three hours to check during the midnight to 8:00 A.M. shift.

Patrol districts can be added to population-based rates as a means of identifying high crimes areas. By virtue of the fact that time spent in checking property is included in the breakdown for each area, they are simultaneously useful in identifying areas high in opportunity for such property offenses as breaking and entering. Though not discussed herein, what has been said above is also true for the patrol districts in effect during the other two shifts.

THE DEPLOYMENT OF THE POLICE AS AN EXPLANATORY
VARIABLE IN ACCOUNTING FOR THE
DISTRIBUTION OF OFFENSES

As in the previous chapters, the measures used in identifying high crime areas have implications for how the concentrations of criminality are to be explained. High crime areas were identified on the basis of population-based rates in Chapter I. The age, sex, and marital status composition of the population in different regions was then examined and an attempt was made to assess the extent to which variations in the demographic profile of the community might contribute to variations in criminality across the same regions. In Chapter II, high crime areas were identified on the basis of environmental opportunities for crime. An attempt was made to identify regional differences in specific opportunities which might contribute to regional variations in criminality. At that point it was also suggested that law enforcement policy and regional variations in the deployment of police personnel might be important factors in explaining regional variations in offenses known to the police. Earlier in this chapter, high crime areas were identified on the basis of the deployment of police motorized patrol and the average time spent dealing with offenses in different areas of the city. Following the pattern of the earlier chapters, one could examine the influence of enforcement policy and manpower deployment in determining which areas become identified as 'high crime areas.'

The literature suggests that the influence is substantial. There is considerable evidence to suggest that the demeanor and personal characteristics of offenders and the personal characteristics of the policemen themselves influence the distribution of arrestees which become

documented in official statistics. In fact, Turk (1969: 9) contends that police data can best be viewed as indicative of the behavior patterns of those who enforce the law and of the policy and normative structures reflected in their efforts. Simply stated, official statistics may tell a good deal more about the agency responsible for generating them than they do about the criminal and delinquent activities in the population.

Others agree. Chambliss and Nagasawa (1969), in comparing arrests and self-reported delinquency for different racial groups (see Table 20), conclude that the discrepancy is large enough to preclude any statement about what one distribution should look like given knowledge of the other. Eleven percent of Whites, thirty-six percent of Negroes, and only two percent of the Orientals studied had been arrested. In terms of self-reported criminality however, over half of both Whites and Negroes indicated that they had high delinquency involvement. Thirty-six percent of the Orientals reported a high delinquency involvement.

Table 20*

Comparison of Arrestees (For 1963)
And Self-Reported Delinquency
Involvement by Racial Groups

Racial Group	% Arrested	% Self-Reporting High Delinquency Involvement
White	11	53
Negro	36	52
Japanese	2	36

*From Chambliss and Nagasawa, 1969: 73.

They sought to explain the divergence between actual delinquency involvement (as measured by self-reported delinquency) and official rates (arrest rates) by reference to the interplay of characteristics of the racial groups on the one hand and features of organizations responsible for social control (primarily the police) on the other. The bias of officials, the visibility of offenses, and the demeanor of the youth when confronted by adult authority was taken to be key variables. Thus police bias against Negroes, the comparatively less visible criminality of Orientals, and the generally respectful attitude shown by Orientals to their elders were among the factors held to explain the findings noted in Table 20 above.

The earlier work of Piliavin and Briar (1964) lends support to the assertions of Chambliss and Nagasawa. They found that the violation per se generally played an insignificant role in determining the nature of the police response to juvenile offenders, except in the case of very serious offenses. Rather, the dispositions of the police were based on personal characteristics of the youths as evidenced in Table 21. (Table taken from Piliavin and Briar, 1964: 207.) Uncooperative youths were more frequently arrested while cooperative youths were more frequently admonished and released.

The explanations discussed above are distinguished from those discussed in the previous chapters in that the focus of the explanation has changed from crime as an objective phenomenon to a process. These explanations attempt to account for criminalization, the process by which the 'criminal' label is attached to a non-random population of the universe of deviants. Explanations of this sort demand data pertaining to the personal characteristics of both policemen and offenders, and to the

nature of their interaction.

Table 21

Severity of Police Disposition
By Youths' Demeanor

Severity of Police Disposition	Youths' Demeanor		
	Cooperative	Uncooperative	Total
Arrest (most severe)	2	14	16
Citation, Reprimand	4	5	9
Informal Reprimand	15	1	16
Admonish, Release (Least severe)	24	1	25
Total	45	21	66

Phrasing the problem a bit differently, one could seek to assess the extent to which the deployment of police personnel influences the geographic distribution of offenses known to the police. In other words, can regional variations in the distribution of crimes (events) known to the police be shown to be a creation of variations in the distribution of police manpower?

In regard to traffic offenses, for example, areas where radar traps are set up create concentration of offenses recorded for those areas. Had the radar been located elsewhere, the distribution of speeding offenses known to the police may indicate a different area as being a 'problem area.' It is clear in this example that the police create the distribution of offenses by virtue of how they allocate their manpower and equipment.

In Chapter III, it was pointed out that the distribution of police manpower might affect the geographic distribution of other offenses as well. A heavy concentration of police in one area may inflate the offense rate for crimes such as drunkenness relative to other areas with similar but less visible criminality, by virtue of there being fewer patrolmen in the area. In respect to the downtown area, Figure 5 shows that police manpower is concentrated in the centre of the city. Not only are the patrol districts smaller, but for several downtown districts the police have found it advisable to use two-man cars. Foot patrol is also concentrated in this area (Edmonton Police Dept., 1970: 4).

This heavy concentration of manpower could affect the occurrence rate in the downtown area in the following ways: (1) the concentration of manpower, enhanced by the mobility of motorized patrol, may enhance the visibility of offenses and, (2) the location of the police headquarters adjacent to the skid-row district results in heavy police movement through this area. This may result in particularly acute amplification of the visibility of offenses in this area.

The increased visibility of offenses in each of the foregoing cases might lead one to predict an increase in offenses known to the police. It must be remembered that the visibility of the police is simultaneously increased, and this may have the opposite effect.

The extent to which regional variations in offense rates are created is less clear in the above cases than it was in respect to traffic offenses. Nevertheless, it may be possible to measure the effect of regional variations in the concentration of police personnel in these and other cases.

The following pages describe procedures by which the relationship between the deployment of police manpower and the distribution of offenses could be assessed. The indicators discussed hereafter require longitudinal analysis and rely on largely adventitious factors to which the researcher must be attuned. They have the advantage of being easy to calculate, requiring nothing more than data relating occurrences to area over the appropriate time period.

Unfortunately, only 1968 offense data are currently available. It is not possible to perform longitudinal analysis, therefore, and the actual carrying out of these procedures is beyond the scope of this thesis. There is considerable assurance that data from later years will be available at some future date. Therefore, the procedures described herein are offered as recommended strategies for future research.

SUGGESTED PROCEDURES FOR MEASURING THE EFFECT OF POLICE DEPLOYMENT ON THE DISTRIBUTION OF LESS SERIOUS OFFENSES

First of all, researchers should be attuned to changes in police deployment strategies. The replacement of foot-patrol with motorized patrol in a given area, for example, might be found to be coincident with an abrupt increase in offenses known to the police. Given a relatively stable occurrence rate in the area in question, one could tentatively conclude that the alternate deployment strategy generated the increase in occurrences. Alternately, a decrease in offenses attributable to the increased visibility of the police would provide equally strong support for the contention that the change in patrol strategy influenced the magnitude of offenses known to the police in the area in question.

Secondly, in the event of either centralization or decentralization of police administration, one could measure the impact of the location of the police station. A significant drop in occurrences in an area where a precinct has been vacated, or conversely, an increase in occurrences in the area surrounding a newly instituted precinct would be one possible result. The decline in offenses in the area with the vacated precinct might be attributable to a decline in the visibility of offenses in the area. On the other hand, the rise in occurrences adjacent to a newly established precinct could be due to the increased visibility of offenses in these areas.

The opposite findings are also possible. In such a case, one would have to argue that the visibility of the police was more important in preventing offenses in an area than their presence was in 'generating' offenses for the area.

Whether there is a pronounced rise or fall in occurrences associated with either of the foregoing changes in police deployment is an empirical question. Either way, a significant change in the number of occurrences would provide support for the perspective to which the indicators are addressed; namely, that regional variations in the deployment of police manpower generates regional variations in offense rates. This implies, of course, that the distribution of offenses may tell more about the conduct of law enforcers than it does about the distribution of offenses. This would be particularly likely for less serious offenses. Support for the preceding argument is evidenced in the work of Lynn McDonald (1969) who found that the strength of the police force is positively related to the offense rate for less serious crimes. For very serious crimes where reportability is uniformly high, the distribution

of patrolmen is less likely to generate high offense rates. McDonald (1969) confirms this assertion as well.

It is probable that the question of whether changes in deployment strategy are coincident with increases or decreases in the number of offenses is of particular interest to police administrators, the city administration, and the social scientist as citizen. The finding that a change in the pattern of offenses, regardless of the direction, would be of special significance to criminologists. Regardless of this potential difference in interest, both are potential beneficiaries of the research strategy outlined. Not the least of the implications to be derived from this discussion is a strong argument in favor of increased communication and a sharing of raw data and the results of research in either quarter.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS OF THE STUDY

Donald Cressey, cited in the introduction, notes that the first requirement of a theory explaining social behavior is the presence of a statement which explains the distribution of the behavior in time and space. The criminological literature contains three major perspectives which attempt to meet this requirement. In one category of analysis, here referred to as the 'Chicago School' and its derivatives, the researchers (Shaw and McKay, 1951; Schmid, 1960) typically calculated the distribution of offenses by using population-based rates. In turn, the distribution was explained by reference to the social and demographic characteristics of the population.

In the second category of analysis, the distribution of offenses is measured relative to the distribution of environmental opportunities for crime. The distribution of offenses is then explained in reference to the criminal attractiveness of the opportunities for specific offenses. Boggs (1965) has made a sizeable contribution to this perspective.

Finally, other researchers have analyzed the distribution of offenses in reference to the attitudinal and behavioral characteristics of both the police and offenders. From this perspective, the distribution of less serious crimes is attributable to the bias of the officers, the visibility of offenses, and the demeanor of offenders when confronted by police authority. Chambliss and Nagasawa (1969) and Piliavin and Briar (1964) were cited as contributors in this category of analysis.

In this thesis, an attempt has been made to examine the measures of the distribution of crime associated with each of the foregoing perspectives, and to make modest contributions to their development. In addition, an attempt was made to document how these improved measures might contribute to more powerful explanations of the distribution of offenses and to more precise predictions of future distributions. The major findings, the limitations of this study, and implications for further research are summarized below.

THE CHICAGO SCHOOL AND ITS DERIVATIVES

Chapter II dealt with population-based measures of the distribution of offenses. It was demonstrated that by not considering the number of persons in the downtown area by the time of day, traditional population-based measures create spuriously high offense rates for the city centre. It is argued that the 'corrected risk population' including shoppers, transients, employees and others in the downtown area between 8:00 A.M. and 4:00 P.M. is a more valid basis for rate calculations for offenses occurring during that time interval and that the corrected rates so obtained are likewise a more valid representation of city centre criminality than are the conventional measures.

Unfortunately, similarly corrected rates could not be calculated for other time intervals and for other areas of the city. As a result, the preceding inferences are somewhat speculative and definitely in need of further study.

This analysis of 'corrected' rates has at least one major implication for further study. While the distribution of offenses in 'space' is a part of virtually all ecological analysis of crime, little attention

has been given to 'time.' The 'corrected' city centre rates contain the explicit recognition that the size of the risk population varies by time of day. Mapping the distribution of offenses by month, week, and hours of the day for this and other areas of the city could offer considerable insight into this neglected aspect of the ecology of crime.

In Chapter II, it was also demonstrated that across very large geographic areas, the distribution of offenses is related to the distribution of young single males. This finding is consistent with those of previous studies relating the distribution of offenses to the demographic profile of the community. It was argued, however, that this finding has little explanatory power.

This analysis rested on the assumption of coincidence between area of crime occurrence and residence of offender. Having suggested that persons who enter the city centre must be included in the risk population of rate calculations for that area, this assumption is difficult to accept. Moreover, the distribution of young single males is also related to the distribution of accommodation such as high-rises, walk-up apartments. It was also observed that these types of accommodations were clustered around concentrations of commercial enterprises. One could then argue that high criminality in such areas may be as much a consequence of the concentration of environmental opportunities for crime as of the characteristics of the persons living in the area.

This alternate explanation has two advantages. In the first place, it precludes having to assume coincidence between crime occurrence and residence of offender. Further, it precludes having to assume that the properties of offenders correspond to the properties of the resident population of the areas under study.

ENVIRONMENTAL OPPORTUNITIES FOR CRIME

In Chapter III, attention was directed at the distribution of offenses relative to the distribution of environmental opportunities for crime. It was found that polling locations containing hotels and shopping centres had considerably more offenses deemed relevant to the presence of such facilities than did adjacent areas without hotels or shopping centres. Since the polling location was the smallest area for which offense data were available, these findings rest on the assumption that in the areas with hotels and shopping centres, the number of offenses over the average for adjacent areas are attributable to the presence of the facility. This assumption seems warranted in view of the fact that the areas with hotels and shopping centres were comparable to contiguous areas in virtually all respects, except for the presence of the facilities.

Secondly, indices of environmental opportunity for crimes were calculated in an attempt to assess regional variation in the extent to which particular opportunities are victimized. An index of auto offenses was calculated for both areas with hotels and shopping centres by using the number of offenses divided by the number of parking stalls. For the hotels, an index of bar crimes was calculated by dividing the number of these offenses by the number of bar seats. For shopping centres, a theft index was calculated by dividing the number of thefts by the retail floor space in the respective centres. In each case, areas with larger indices were judged as being proportionately more criminally attractive than areas with low indices.

Using the same logic, property-based offense rates were calculated using the number of businesses checked by the police on night shift (12 P.M.-8 A.M.) in the denominator and the incidence of breaking and

entering in the numerator. Areas ranked highly criminal by population-based offense rates ranked low in terms of offenses per opportunity and vice versa. It was argued that the property base was the superior measure for making regional comparisons on the assumption that the distribution of opportunities for breaking and entering is more relevant to the occurrence of these offenses than is the population in the areas under study.

The first weakness in the preceding inferences is that the offense data pertain to the area with the opportunity structure and not the facility itself. The second pertains to the validity of using such features as bar seats, parking stalls, and pieces of property in calculating offense rates. While the relationship between the particular offense and the base used make intuitive sense (i.e., auto offenses and parking stalls), the validity of these alleged relationships has not been demonstrated.

Accepting for the moment that this study has demonstrated the relationship between the distribution of offenses and environmental opportunities for their commission, and secondly, that such opportunities in one region are more exploited than similar opportunities in other areas, two recommendations can be made for future study. First, the validity of the opportunity-based measures used in this study must be tested. In essence, this would require the researcher to assign offense data to street address or, in the case of the bar index, to the bar itself. If this were possible, one could accurately assess both the extent to which selected environmental opportunities are criminally attractive and whether the indices proposed are valid measures of this phenomenon.

This, of course, would diminish the distinction between indices of specific offenses and property-based rate calculations for specific offenses. In each case, the base/denominator would be the property designated by the street address, and the numerator would be offenses designated by street address. If the pieces of property (businesses), parking lots, and other bases were shown to be valid measures of opportunity, property-based rates could be a valid generalization of this relationship. Secondly, assuming that the validity of the preceding measures is established, the principal task of future studies is to explain the findings generated by the preceding analysis.

Measuring offenses related to the availability of opportunities for their commission suggests that the characteristics of the opportunity itself, the characteristics of the clientele and the deployment of police manpower as possible explanatory variables which may account for regional variations in the extent to which specific opportunities are exploited. In the elusive search for explanatory variables these would seem to be appropriate points of departure. It is clear that as measures of the distribution become increasingly sensitive, the demands for explanations are proportionately increased. It is hoped that the current study will serve as a basis for further refinements in both the actuarial and explanatory dimensions of the ecology of crime.

THE DEPLOYMENT OF THE POLICE MANPOWER

Police Deployment as a Measure of the Distribution of Offenses

At the outset, the characteristics of the patrol districts proposed by the City of Edmonton Police Department (Resource Allocation

Study, 1970) were discussed. Since each district represented an equivalent work-load for the eight-hour interval from midnight to 8:00 A.M., the size of patrol districts provides an additional measure of the distribution and intensity of the crime problem.

The Deployment of Police Manpower as an Explanatory Variable
In Accounting for the Distribution of Offenses

Secondly, attention was addressed to the perspective that suggests that the distribution of offenses known to the police tells more about the agency generating the statistics than it does about the actual distribution of the behavior (Turk, 1969). The works of Chambliss and Briar (1964) were cited in support of this perspective. In respect to less serious offenses, both studies found that the bias of police officers and the demeanor of youth were more important in determining whether the crime became a statistic than was the nature of the offense itself. These studies used data pertaining to the behavior and attitudinal characteristics of police and offenders and their interaction in reaching these conclusions.

With indirect support for Lynn McDonald (1969), it was argued that measures of the extent to which the deployment of police manpower generate offenses known to them could be assessed in a much simpler fashion. If a change in the concentration of officers in an area was accompanied by a pronounced rise in the offense rate for that area, it is reasonable to infer that the change in deployment strategy generated the sudden change in the incidence of less serious offenses. This change could be attributed to both the increase in the visibility of offenses or, as McDonald suggests, an increase in personnel in an area may give officers more time to investigate less serious offenses.

The measure proposed above only requires knowledge of changes in deployment strategy and the customary distribution of offenses by area (like those used in this study) for before and after the change. It is offered as a further means of gaining insight into the extent to which the deployment of the police affects the distribution of offenses. This knowledge, in turn, would help one determine whether the distribution of less serious offenses is a valid representation of the distribution of the behavior described by the offense statistics.

The results of this study contribute a modest improvement to the methodology associated with each of the three major perspectives on the ecology of crime. The suggestions for future research arising out of this study will hopefully stimulate successive refinements both in measurement and explanation. New dimensions of analysis have been opened, and what borders on speculation in this study provides hypothesis for its successors.

BIBLIOGRAPHY

- Beattie, R. H.
1955 "Problems of Criminal Statistics in the United States." Journal of Criminal Law, Criminology, and Police Science, 46 (July-August).
- Boggs, Sarah L.
1965 "Urban Crime Patterns." American Sociological Review, 30 (December).
- Chambliss, W. J. and Nagasawa, R. H.
1969 "On the Validity of Official Statistics." Journal of Research in Crime and Delinquency, 6 (January).
- Chilton, R. J.
1966 "Persistent Problems of Criminal Statistics," in Dinitz, S. and Reckless, W. C. (ed.). Critical Issues in the Study of Crime. Boston: Little, Brown and Company, 1968.
- City of Edmonton, Planning Department.
"1966 and 1968 Cordon Counts, Hotel List." Population Data: 1968 Census.
- City of Edmonton, Police Department.
"Resource Allocation: A Survey of Patrol Districts,"
Phase 1: April 1970; Phase 2: June 1970.
- Patrol District Maps, 1968.
- Data Summary, 1968.
- Cressey, D. R.
1960 "Epidemiology and Individual Conduct: A Case for Criminology." Pacific Sociological Review, 3 (Fall).
- Dominion Bureau of Statistics.
1966 Census of Canada: Edmonton Census Tract Bulletin c-26
- Crime Statistics. #85201, 1967.
- Giffen, P. J.
1964 "Regional Statistics and Their Uses: A Geographic Viewpoint," in Ostry, S. and Rymer, . (ed.). Canadian Political Science Assn. Conference on Statistics: Papers on Regional Statistical Studies.

- Hardt, R. H.
1960 A Delinquency Profile of Syracuse and Onondaga County, N. Y. New York: Youth Development Centre, Syracuse University.
- Hyman, H.
1957 Survey and Design Analysis. Glencoe, Ill.: The Free Press.
- Kitsuse, J. I. and Cicourel, A. V.
1963 "A Note on the Uses of Official Statistics." Social Problems, 11 (Fall).
- Kobrin, S.
1951 "The Conflict of Values in Delinquency Areas." American Sociological Review, 16 (October).
- Lander, B.
1954 "An Ecological Analysis of Baltimore," in Wolfgang, M., et al. (ed.). The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc., 1962.
- Lohman, J. D.
1957 Juvenile Delinquency. Chicago: Office of the Sheriff, Cook County, Ill..
- McDonald, Lynn.
1969 "Crime and Punishment in Canada: A Statistical Test of 'Conventional Wisdom.'" Canadian Review of Sociology and Anthropology, 6 (4).
- McVey, W. W., Jr.
Edmonton and Calgary: A Demographic Profile. Unpublished Report, The University of Alberta, Sociology Dept.: April 1971.
- Morris, T.
1957 The Criminal Area. London: Routledge and Kegan Paul.
- 1958 "A Critique of Area Studies," in Wolfgang, M., et al. (ed.). The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc., 1962.
- Nease, Barbara.
1966 "Measuring Juvenile Delinquency in Hamilton." Canadian Journal of Corrections, 8 (April).
- Nye, I. F. and Short, J. F., Jr.
1957 "Reported Behavior as a Criterion of Deviant Behavior," in Wolfgang, M., et al. (ed.). The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc., 1962.

- Park, R., et al.
1925 The City. Chicago: University of Chicago Press.
- Piliavin, I. and Briar, S.
1964 "Police Encounters with Juveniles." American Journal of Sociology, 69 (September).
- Reckless, W. C.
1966 The Crime Problem. New York: Appelton C. C..
- Savitz, L.
1967 Dilemmas in Criminology. Toronto: McGraw-Hill Book Co.
- Schmid, C. F.
1960a "Urban Crime Areas: Part I." American Sociological Review, 25 (August).
1960b "Urban Crime Areas: Part II." American Sociological Review, 25 (October).
- Sellin, T.
1951 "The Significance of Records of Crime," in Wolfgang, M., et al. (ed.). The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc., 1962.
- Shaw, C. and McKay, H. D.
1951a "An Ecological Analysis of Chicago," in Wolfgang, M., et al. (ed.). The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc., 1962.
1951b "Theoretical Implications of the Ecological Analysis of Chicago," in Wolfgang, M., et al. (ed.). The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc., 1962.
- Taeuber, G.
1968 "Counting the Invisible Americans: The Inner City and the 1970 Census," U.S. Dept. of Commerce, Series GE 40: #5. Papers presented at the Conference on Small-Area Statistics, American Statistical Association.
- Turk, A. T.
1969 Criminality and Legal Order. Chicago: Rand McNally and Company.
- Wilkins, L. T.
1965 "New Thinking in Criminal Statistics." Journal of Criminal Law, Criminology and Police Science, 56 (September).

Wolfgang, M., et al. (ed.).

1962 The Sociology of Crime and Delinquency. New York: John Wiley and Sons, Inc..

1970 The Sociology of Crime and Delinquency. 2nd ed. New York: John Wiley and Sons, Inc..

APPENDIX I

THE POLICE DATA

The Data:

The Edmonton City Police Department provided a copy of their 1968 offense data summary for use in the current study. The summary was in the form of an I.B.M. magnetic tape containing data on over fifty-eight thousand offenses. Upon receipt of the tape, it was edited and illegal characters were removed making it suitable for manipulation with FORTRAN programs.

Offenses were listed on the tape as follows. Part I (serious) crimes were listed first, under the headings "Offenses against the Person," "Break, Enter, and Theft," "Theft," and "Auto Theft." Following this, the Part II (less serious) crimes were listed under such headings as "Assaults," "Frauds," "Vice," "Disorderly Conduct," "Vagrancy," and so on. Each of the fifty-eight thousand records showed the Polling Location (1966) of the offense, the Patrol District (1968) of the offense, and whether the offense was 'reported' or 'unfounded.' Information pertaining to the dollar value of property stolen, the month the offense occurred in, and similar contingencies was incomplete and therefore not used in the current study.

Data Processing:

Since this is an ecological study, a series of programs was devised so that offenses (both individual cases and the groups noted above) could be listed according to the geographic areas in which they occurred. The total number of offenses for the respective areas is, in every case, the total number of offenses known to the police for 1968. The number of offenses known to the police was calculated by subtracting cases identified

as 'unfounded' from those marked 'reported' on the original data.

Crime by Polling location:

The first step was to group offenses by polling locations (N=267, 1966). From the computer printout it is possible to tell at a glance how many offenses of what type occurred in each polling location. Since polling locations are small, averaging approximately 10-15 city blocks, this printout provides a fairly sensitive measure of the distribution of offenses. The procedure noted above was then reversed, making 'type of crime' the control variable. Thus for each type of offense, it was easy to isolate the areas in which the cases occurred. These data were helpful in identifying patterns in the distribution of specific offenses or classes of offenses.

Crime by Patrol districts:

A similar procedure was followed in assigning offense data to patrol districts appropriate to the eight-hour intervals from 8:00 A.M. to 4:00 P.M., from 4:00 P.M. to midnight, and from midnight to 8:00 A.M.. First, patrol districts were used as the control and the printout shows the number and type of offenses occurring in each area. This was reversed as above, making 'type of crime' the control variable. Printouts were thus obtained listing the areas of occurrence for each type of crime.

Since patrol districts are much larger than polling locations (8:00 A.M. to 4:00 P.M., N=18; 4:00 P.M. to midnight, N=18; and midnight to 8:00 A.M., N=37) they provide a less sensitive measure of the distribution of offenses. They do, however, provide a vehicle for distributing offenses by eight-hour intervals. This was not possible with polling locations.

In all, there are eight sets of data, "crime by area" and "area by crime" for polling locations and patrol districts for the three eight-hour intervals. The accuracy of the computer programs was checked by making a comparison of summary data in the "crime by area" data sets with equivalent records in the "area by crime" data sets. Randomly selected entries from these data sets were then compared to the records in the original printout taken directly off the tape. Though it was impossible to check every record, the above procedure did not expose any errors in data manipulation.

Sample Rate Calculation:

Table 1 (page 9) shows "Part I Crimes" and "Theft" rates for the patrol districts appropriate to the 8:00 A.M. to 4:00 P. M. shift. By using these geographic areas it was possible to consider only those offenses which occurred between 8:00 A.M. and 4:00 P.M.. Part I (serious) crimes occurring during this interval were used in the numerator of the first set of rate calculations. Since these offenses are more serious and therefore more likely to be reported to the police than Part II crimes, it was felt that they were the most reliable and valid measure of crime available. "Theft" rates were also calculated since this offense is both a Part I crime and one for which occurrences may be particularly high during business hours. The total resident population in patrol districts was used in the denominator of both sets of rate calculations. This is a conventional format for rate calculation and is appropriate to the intent of the table, which is to illustrate the distribution of offenses on the basis of conventional population-based measures.

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